

**ACIDIC PRECIPITATION
IN ONTARIO STUDY**

**AN ASSESSMENT OF THE
PERFORMANCE OF THE
APIOS DEPOSITION
MONITORING NETWORKS
JANUARY 1982 – DECEMBER 1984**

NOVEMBER 1988

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**Jim Bradley
Minister**

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JANUARY, 1982 - DECEMBER, 1984**

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1.0 INTRODUCTION

This report assesses the performance of the APIOS (Acidic Precipitation in Ontario Study) precipitation and air sampling networks (daily and cumulative) from January, 1982 to December, 1984. Data reports for this period have previously been published for both the daily network (1)(2) and the cumulative network (3)(4).

The daily network comprises of precipitation and air sampling sites which collect samples on a daily basis. The Aerochem Metrics (wet-only sampler) was the primary collector used for sampling precipitation during this period. An SES (Sudbury Environmental Study) bulk precipitation collector was used for the first four months of 1982 (January to April). Precipitation depth measurements were taken at each site using an AES (Atmospheric Environment Service) Type B standard rain gauge during the summer sampling periods (May to October) and a Nipher-shielded snow gauge during the winter sampling periods (November to April).

Metrex sequential air samplers (Type SAS 8-25) are utilized in the daily air sampling network in conjunction with 47 mm polypropylene filter packs. These samplers are loaded weekly with 8 filter packs, 7 of them active and 1 passive. Each active pack is exposed for 24 hours (flow rates of 20 litres per minute) and the passive filter pack is used for passive loading corrections. A site map of the daily network sites is provided in Figure 1.

The cumulative precipitation network uses MIC Type A wet-only precipitation collectors. Co-located with the MIC collectors are precipitation gauges which act as the primary standards of the precipitation depth. Precipitation samples are collected over 28-day periods in fresh polyethylene/nylon laminated bags inserted into the buckets of the collector.

Metrex low volume air samplers (Type AS-2) are utilized in conjunction with filter packs in the cumulative air sampling network. Each filter pack is exposed for a 28-day period (flow rates of 2 litres per minute)

coinciding with the precipitation sampling period. A site map of the cumulative network sites is provided in Figure 2.

The detailed sampling procedures of both the daily and cumulative networks are available in separate reports (5)(6). This performance assessment consists of evaluating field and office observations, validation flags, and quality assurance/control (QA/QC) data which have been collected during 1982-1984. Laboratory performance is presented using available laboratory quality control (QC) data obtained for the same period. All results in this evaluation have been screened and validated. Any data that have been labelled as "unreliable" during this validation process have been omitted from the assessment.

Contained in Tables 1 and 2 are the monitoring site names and corresponding numbers which have been used in the figures and tables throughout the report.

2.0 CUMULATIVE MONITORING NETWORKS

The following sections assess the performance of the cumulative precipitation and air monitoring networks.

2.1 PRECIPITATION SAMPLING

During the 1982-84 period, 1363 cumulative precipitation samples were collected. The following sections refer to cumulative (28 day) precipitation samples only. Appendix 1 contains site summary reports and a combined site report for the 1982-84 sampling period.

2.1.1 Field Observations

Field observations are appended to the data as codes to indicate sampling problems and the conditions of samples prior to laboratory analyses. The sampler efficiency with respect to the precipitation gauge is also reported.

A malfunction of the precipitation collector results in the code "F" being appended to the reported data. During 1982 - 1984, an average of 12% of all samples were reported with this condition. Other codes, however, reflect problems that affect the integrity of collected samples. Hydro failures, missed events due to the collector not "sensing" precipitation properly or the sampler opening when there is no precipitation are all problems which can affect the sample chemistry and representativeness. Therefore, any sample which was coded either as events missed (coded I), wet side open when not precipitating (coded J), no precipitation collected (coded K), part of event missed (coded L), sampler malfunctioned (coded F) or sample not submitted or lost (codes E and X) are considered as "samples affected" in this evaluation.

During 1982-84, an overall average of 15.8% (compared to 23% during 1980-81) of all samples were "affected" excluding samples lost or not submitted which accounted for another 2% and 3%, respectively. There-

fore, some improvement has been made in reducing downtime and other sampling problems.

The percentage of samples affected for individual sites is shown in Figure 3. These percentages ranged from a low of 0% (Azure Lake and Kaladar) to highs of 30.8% (Port Stanley), 31.6% (Pickle Lake), 37.9% (Milton), 40% (Whitney), and 71.4% (Otter Island - note: only 7 samples were collected during this assessment period; the site was operated only in the summer for the period 1984 to 1987).

Whenever a sample has leaked or been spilled, the code G or H is appended to the sample in the data report. During 1982-84, an average of 15.2% of all samples leaked or spilled. During 1980-81, 20.7% of all samples leaked or spilled. The improvement (approximately 6%) can be attributed to a different type of bag introduced in the beginning of 1983 to reduce the number of leaks.

The majority of leaks/spills occur in the Northeast and Northwest Regions where severe cold weather is encountered. Sites with abnormally high percentages were McKellar (35.9%), Lac La Croix (38.5%), and Gowganda (47.4%).

Sampler collection efficiencies are calculated by converting the collected sample volume to an equivalent precipitation depth. This depth is compared to the precipitation gauge depth to determine the collection efficiency of the sampler. Any collection efficiency less than 50% or greater than 120% is considered abnormal and a code "N" is appended to the sample in the data report.

The average collection efficiency during 1982-84 was 71.6% (compared to 61.4% for 1980-81). The average efficiency for summer sampling (May to October) was 74.7%, while for winter sampling (November to April) the average was 67.4%.

The average efficiency for individual sites is shown in Figure 4. These percentages ranged from a low of 32.6% (Attawapiskat) to a high of 88.2% (Dorset). Attawapiskat (site was removed in 1983) had many

sampler problems and samples were prone to vandalism and contamination.

Sites which had average collection efficiencies less than 65% should be reviewed by technical staff to determine the reasons for these lower efficiencies. These sites are Wilkesport, Campbellford, Gowganda, Moonbeam, Lac La Croix, ELA (Experimental Lakes Area), and Ear Falls (note: some sites which have been removed are not mentioned). Collection efficiency problems may be due to improperly operating instrumentation, poor siting (windy location), or improper precipitation gauge measurements recorded by the site operator.

2.1.2 Data Validation Codings

Data validation consists of various manual checks, screening tests, and statistical techniques to identify data reporting errors and unusual or suspect data. Various codes are appended to identify data that have been flagged during these validation procedures. These data validation procedures are described elsewhere (7).

Discrepancies between the calculated and observed conductance, pH, and ionic balance are identified in the data report by codes "C" "H" and "M" respectively. A Gross limit check and Dixon ratio test are also applied to the dataset and failures of these tests result in the letters "G", "D" or "B" (referring to failure of both the Dixon ratio or Gross limit tests or Both) appended to the sample result. Subjective screening of these results may lead to the code "U" (unreliable result) appended to a particular result. Unreliable results will not be included in any future statistical analyses. Table 3 shows the frequency of these validation codes for every cumulative network site.

Conductivity discrepancies occurred in 5.2% of samples for the entire network; poor ionic balance discrepancies occurred in 7.0%; and poor calculated versus observed pH discrepancies occurred in 12.1% of all samples. Unreliable result codings occurred in 3.5% of all sample results (sample volumes coded unreliable are not included), while

failure of the Gross limit test and Dixon ratio test occurred in 0.9%. The failure of both the Dixon ratio and Gross limit tests occurred in 0.2% of all sample results.

Table 3 also shows the percentages of flagged data results for each site. Flagged data results are results which have been flagged with either an unreliable code (U), a Gross limit code (G), a Dixon ratio code (D) or Both code (B) indicating failure of both the Gross limit and Dixon ratio tests.

The total percentages of flagged results from individual sites range from a low of 1.0% (Wilberforce and Dorset) to highs of 11.3% (Dalhousie Mills and Winisk), 11.4% (Smiths Falls), and 11.9% (Attawapiskat). Winisk and Attawapiskat have been removed from the network. Dalhousie Mills and Smith Falls are considered "fair" sites in terms of siting criteria due to a few potential siting problems at each site. However, the problems are not currently considered severe enough to warrant moving these sites particularly in view of their rough data record.

2.1.3 Data Recovery

Data recovery in this section is calculated by dividing the total number of reported data results by the expected number of data results. The expected number of data results is calculated by multiplying the number of operating periods (28 day periods) by the expected number of analyses per sample (24 per sample including metals). Data recovery therefore reflects on the instrumentation, sample handling, laboratory capabilities (volume required for analyses) or any other operating protocols that could affect the completeness of the data set from each site. Data flagged as unreliable, failing the Gross or Dixon ratio tests, or coded as having sampling problems (malfunction of any kind) are both included and excluded in the data recoveries calculated below to show the differences between "recovered" data and "unaffected recovered" data.

Figure 5 shows the percentage of data "recovered" and "unaffected recovered" for each monitoring site. The average percentage of

"recovered" data for the network during 1982-84 was 91.9% (compared to 83.4% for 1980-81). The percentage for each site ranged from a low of 60.5% (Attawapiskat) to highs of 99.8% (Wilberforce) and 100% (Azure Lake, Otter Island). However, as noted in Section 2.1.1, only 7 samples are available from Otter Island. Two major factors contributing to lower recovery percentages for all sites are the frequency of spills/leaks and lower sampler collection efficiencies. In both cases, a smaller volume of sample is obtained potentially resulting in below the minimum required for a complete laboratory analyses.

The average percentage of "unaffected recovered" data for the network during 1982-84 was 75.2%. Compared to "recovered" data this represents a difference of approximately 17%, in which the majority of the difference is directly attributable to sampler malfunction related problems.

Individual site "unaffected recovered" data ranged from lows of 25% (Otter Island - only 7 samples), 43.3% (Attawapiskat), 51.4% (Milton) and 59% (Whitney) to highs of 90.8% (Wilberforce), 93.2% (Kaladar) and 93.6% (Azure Lake).

2.1.4 Quality Assurance/Control

Quality assurance and quality control (QA/QC) is an integral part of the APIOS monitoring program. A QA plan (8) and manual (9) have been developed, and the plan implemented to assure that data reported are accurate, precise, complete, and representative. The following sections describe three types of samples and procedures which have been implemented as part of ongoing QA/QC efforts.

Blank Bags

Sampling bags used in the cumulative precipitation monitoring network are manufactured and purchased from one supplier. After receiving a new shipment of bags from the supplier (usually once every two years), a number of new blank bags (minimum of 20) are analyzed by the laboratory to ensure cleanliness. After these tests are complete and results

are acceptable, bags are shipped to regional offices to be stored and used by the regional technical staff overseeing the monitoring sites.

To ensure that sampling bags maintain their integrity in the regional offices, one blank bag of each type from each region is removed from their supply and submitted for chemical analyses.

Table 4 shows the concentration percentiles of 8 blank bags submitted by various regional offices during 1984. For comparison purposes, the detection limit (W) and detection criterion (T) are also shown. The detection limit (W) is interpreted as the minimum measurable amount. Any result less than or equal to W is interpreted as zero since no measurable response was found. The detection criterion (T) is interpreted as a measurable response in which the analyte may or may not be present in the sample.

Percentiles are calculated using all data (<W assigned a zero and <T assigned $\frac{1}{2}$ the reported value). The 50th percentile (median) for all parameters are at or below the detection limit. Chloride blank levels are higher than the detection limit starting at the 75th percentile (.04 mg/l blank versus .01 mg/l for W and .03 mg/l for T). Therefore, some minor chloride contribution is evident from blank bags submitted from the field on a random basis.

Composite Solution Handling

Composite precipitation samples of known chemical concentrations are handled by site operators in the cumulative precipitation network. Aliquots (250 ml) of a composite solution were prepared and shipped to monitoring sites. Site operators pour an aliquot into a new sample bag in the collector and immediately remove the sample following standard operating procedures. Three aliquots are initially analysed prior to shipment and three aliquots are stored and later analysed with the "handled" aliquots from the field sites. Standard procedures are followed at all times for sample handling, storage, shipment, and laboratory analyses.

Table 5 shows the results of three handling submissions. For each submission, at least 10 monitoring sites participated. The results show that there are noticeable concentration changes for some parameters, particularly Mg^{++} , Na^+ , and K^+ ; however, these changes occur randomly for both handled and final laboratory samples. Because of some of these inconsistencies, it is difficult to determine the contamination source. The majority of parameters show quite good consistency for both handled and final laboratory concentrations indicating little or no contributions or losses from network handling and storage protocols.

Co-located Sampling

Table 6 shows the overall absolute percentage differences for concentration and deposition of co-located samples collected at five sites across the network during 1982-84. Individual site co-located data can be found in Appendix 2.

Using the 50th percentile as an indicator of the overall network sampling precision, concentration reproducibility (100 - median absolute % difference) was found to be better than 90% for the acid-base parameters (total H^+ , free H^+ , $SO_4^{=}$, NO_3^-). Gauge depths and sample depths (determined from sample volume) were reproducible to 95%. Soil related parameters ranged in reproducibility from 92% (Mg^{++}) to 64% (K^+); trace metals ranged from 100% (Mn, Ni,) to 60% (phosphorus). Note that for some trace metals (particularly Zn, Cu, Al, and Pb) the majority of results were at the <W (detection limit) reporting level and would not be included in the reproducibility calculations because of the necessary division by zero.

Deposition reproducibilities were found to be similar to the concentration reproducibilities. This is expected since gauge depths were reproducible to 95%.

2.2 Air Sampling

During the 1982-84 period, 857 cumulative air samples were collected. The following sections refer to cumulative (28 day) air samples only. Appendix 2 contains site summary reports and a combined site report for the 1982-84 period.

2.2.1 Field Observations

Samples are submitted from the regional field offices with field comment codes while office observation codes are appended during the data validation process.

During 1982-84, an average of 7.8% sampler malfunctions occurred across the network. The major cause of malfunctions was vacuum pump failure. Individual site malfunction averages during this period ranged from a low of 0% (Ear Falls, Otter Island, Nakina, Turkey Lakes, Kaladar) to 20.7% (Milton).

Other field codes such as known/suspected hydro failures, suspect flow volumes, known/suspected contamination, incorrect filter placement, and sample not submitted are also used as field observation codings. These codes and the associated frequencies can be found for each site in the summary reports in Appendix 3.

2.2.2 Data Validation Codings

The validation process for air sampling is similar to that described in section 2.1.2 of the precipitation networks. Various checks and screening tests are applied to the air data with validation codes appended to flag specific data.

Samples are appended with the office comment "F" to indicate that the sampled flow volume is outside the range of an expected daily average of 2880 litres \pm 50% (2 litres per minute x 24 hours). During 1982-84, 6% of all network data were appended with this code.

Sample field sheets are appended with the code "X" if the sample were lost. During the 3 year period, no samples were misplaced or lost.

An abnormal sampling period will result in the Code "Z" appended to the sample. An abnormal period is one in which the scheduled on and off sampling dates were not adhered to. The highest frequencies of this code occurred at Pickle Lake (26%), Mattawa (28%), Killarney (31%), Moonbeam (28%), and Attawapiskat (64%). The network average was 12% for abnormal sampling periods. Operators of sites with these higher frequencies should be informed of the need to adhere to sample change-over dates.

Individual reported results can have result remark codes appended during the validation process. Principally, two result codes are used: unreliable result (U) and exceedence of the Dixon ratio test (D). During 1982-84, an average of 2.2% of all results were coded as unreliable and exceeding the Dixon ratio limit. Results for individual sites were as high as 12.5% unreliable (Attawapiskat), and for samples exceeding the Dixon ratio test, 6.6% (Mattawa), and 8.0% (Otter Island).

2.2.3 Data Recovery

Data recovery is defined as the method described for precipitation sampling in section 2.1.3 (i.e., reported results/expected results). Valid data recovery is defined as data with no "U" (unreliable) code or "F" (data unvalidated due to low flow volume) code. Both these recoveries are shown for every site in Appendix 2.

For the overall network, an average of 87.3% of all valid data is recovered compared to 92% data recovery when all data are included. Individual site valid data recoveries varied from lows of 43.2% (Attawapiskat) and 66.9% (Milton) to highs of 99.2% (Otter Island) and 100% (Turkey Lakes - installed during 1983, only 15 samples).

2.2.4 Quality Assurance/Control

Internal quality assurance/control procedures in the cumulative air sampling network consist primarily of filter blanks, handling blanks, and estimating the overall precision of the measurement technique by co-located sampling.

Blank filters from every filter batch purchased (teflon, nylon, Whatman 40) or prepared (impregnated Whatman 41) are submitted for blank analyses. Three filters of each type from every lot are analysed (note: effective late 1986, between 10 and 20 filters of each type are submitted, depending on filter type).

Handling filter blanks are submitted as well by having field staff load filter packs and store them at designated monitoring sites for a representative period (28 days for low volume air samples).

Blank and Handling Filters

Whatman 40 blank filter and handling blank results for 1982 to 1987 are shown in Table 7. Additional years beyond 1984 were included in order to have a sufficient sample size for discussion. The majority of these blanks were analysed from 1985 to 1987.

Cl^- and Cd blank loadings were found to be high when compared to field loadings found in the two northern regions (Northwest and Northeast). The majority of blank filters for Cd were detectable with an average loading of 0.010 ug/filter (standard deviation, .006). The first and second quartiles of the Northwest and Northeast regions ranged from .008 to .035 ug/filter (converted from ug/m^3 to ug/filter using a factor of 75,000 litre of air sampled).

The significance of W40 blanks is presently under evaluation and further actions are planned either to apply a blank correction or to flag low level data for a number of Whatman 40 parameters. Parameters which are consistently not detected (>50% results <W) on the Whatman 40 filter are particulate $\text{SO}_4^{=}$, NO_3^- , Al, Mn, Ni, Pb, V and Zn. The remaining

parameters along with their percentage of blank results less than detection limits (W) and less than the detection criteria (T - equivalent to 5W) in parentheses are: Ca^{++} (0% <W, 98% <T), Mg^{++} (33% <W, 63% <T) Cd (6% <W, 27% <T), Cu (28% <W, 63% <T), Fe (2% <W, 0% <T), Na^+ (1% <W, 3% <T), K^+ (47% <W, 39% <T) and Cl^- (2% <W, 0% <T).

The handling pack Whatman 40 results generally show identical loadings to those of the blank filters indicating that the handling and storage protocols are not affecting data quality. A small increase (.03 vs .13 ug/filter) of Cu loading is noticed for the handled filters over the blank filters.

Nylon and impregnated Whatman 41 filters show no appreciable loadings on blank and handling pack filters. A few results were above detection limit however, these results were always less than the detection criterion and were insignificant compared to field loadings.

Co-located Sampling

One monitoring site in every region is equipped with duplicate instrumentation for estimates of precision. Absolute percentage differences for each parameter were calculated using the absolute concentration difference between samplers divided by their average. Concentration percentiles are shown in Table 8 for all sites during 1982-84 (approx. 50 sample pairs). Individual site co-located results can be found in Appendix 2.

Sampling reproducibility (defined as $100 - \text{median absolute percentage difference}$) was better than 88% for particulate $\text{SO}_4^{=}$ and NO_3^- , HNO_3 , Cl^- , and V. Reproducibilities of 80% or better were noted for SO_2 , Ca^{++} , Na^+ , Fe, Mg^{++} and Mn; while the remaining parameter reproducibilities were K^+ (66%), Al (77%), Pb (78%), Cu (60%), Ni (55%), Zn (75%), and Cd (78%). Other concentration percentiles, such as the 75th, showed reproducibilities for all parameters as 60% or lower. Ni was the least reproducible parameter in the cumulative air sampling network.

3.0 DAILY MONITORING NETWORKS

The following sections assess the performance of the daily precipitation and air monitoring networks.

3.1 PRECIPITATION SAMPLING

During the 1982-84 sampling period, 5584 precipitation samples were collected from the daily precipitation monitoring network. A total of 16 sites were originally installed in the network. Two sites were removed in 1984 namely, Whitman Creek (October 29, 1984) and Lac la Croix (March 15, 1984). Appendix 3 contains individual site summary reports as well as a combined site report for the period 1982-84.

3.1.1 Field Observations

Similar field codes to those appended in the cumulative precipitation network are used in the daily precipitation network.

Samples which were coded with any one of the following codes are considered "samples affected" in this section: sampler malfunction (coded F), events missed (Coded I), wet side open when not precipitating (coded J), no precipitation collected (coded K), part of event missed (coded L), dry side open when precipitating (coded M), sample lost (coded X), or sample not submitted (coded E).

During 1982 to 1984, 781 out of 5584 samples (14%) were considered "affected". For comparison purposes, approximately 11% (6% sampler malfunctions, 5% not submitted) of samples during 1980-81 were considered affected. Approximately 12% of all samples were not submitted either due to no precipitation collected in the sampler, insufficient volume for chemical analyses (<10 mls), sample leaked/spilled, or the sample was lost (percentages for leak/spill and lost are approximately 2%).

Affected samples from individual sites ranged from a low of 4.8% (Melbourne) to highs of 22% (Whitman Creek, Quetico Centre), and 25%

(Forbes Township). The higher percentages of affected samples from these sites are primarily due to more frequent codings of samples not submitted, except for Whitman Creek, where almost 15% of all samples were affected by sampler malfunctions. Figure 6 shows the frequency of field comment codings for individual sites during 1982-84.

Leaks and spills occurred for 1.8% of all samples collected during 1982-84. This is a small improvement observed over the period 1980-81 (3.7%) and can be attributed to the new sampling bag introduced in 1983.

Using standard Atmospheric Environment Service rain gauges and Nipher-shielded snow gauges, sampler collection efficiencies are calculated for every collected sample. Any collection efficiency less than 50% or greater than 120% is coded as an abnormal efficiency (office code N).

During 1982-84, an overall network average collection efficiency of 78.5% was observed. The efficiencies during the summer (May to October) and winter periods (November to April) were 84.5% and 70.5% respectively. Individual site collection efficiencies during 1982-84 averaged from lows of 68.8% (Lac La Croix) and 69.3% (Whitman Creek), to highs of 97.6% (Otter Island - only operated from June to November, 1984), 83.2% (Forbes) and 83.6% (Melbourne). Monitoring sites with average collection efficiencies less than 60% should be reviewed by technical staff to ensure instrumentation and gauges are set up and operating properly and that operators are correctly reading gauge depths.

3.1.2 Data Validation Codings

Validation codings are used to identify data reporting errors, unusual, or suspect data. The specific codes used are identical to those discussed in section 2.1.2 of the cumulative precipitation monitoring network. Details of these validation procedures can be found elsewhere (10).

The frequency of these validation codes for each site during 1982-84 can be found in Table 9. Individual sites had total percentages of flagged results ranging from lows of 0% (Otter Island, only 51 samples), 3.0% (Railton), and 3.9% (Dorset), to highs of 9.3% (Graham Lake) and 11% (North Easthope). The Graham Lake site was removed during the summer of 1986 due to operator problems. These operator problems related to inconsistent sample collections by the operator and should have no relationship with the higher number of flagged results.

The North Easthope site is located behind the operator's residence in a rural location. During 1982 and 1983, the majority of validation codes appended at this site were unreliable codings. For 1984, the validation codings were principally gross limit exceedances (6.2%) with a few failures of Dixon ratio test (1.8%) and both gross limit and Dixon ratio test (1.6%). Due to some improvement during 1984 (less than 10% data coded), there is presently no reason to remove the site. The 1985 data should be checked to ensure that the frequency of validation codes is within reasonable limits ($\leq 10\%$).

Overall in the daily precipitation network, an average of 6.5% of all reported data were flagged. Unreliable result codings accounted for 3.6% (note: during 1980-81, 3.7% of Aerochem Metric sample results were coded unreliable), while gross limit and Dixon ratio test codings comprised the remaining 2.9%. The frequency of unreliable results, gross limit and Dixon ratio codes for every site is shown in Figure 7.

Other data validation codings are used in the reporting of sample results. These other codings are appended to the sample rather than a particular sample result and include the following: conductivity discrepancies, lab and field pH discrepancies, one or more parameters high, poor ionic balance, poor calculated vs. observed pH, non-standard collection periods, non-standard sampling period, and abnormal sampler (collection) efficiency.

The frequency of these codings for every site can be found in the site summary reports contained in Appendix 4. The most frequent appended codes during 1982-84 for the network were: poor ionic balance (Code M)

6.3%, conductivity discrepancy (code C) 7.1%, poor calculated vs. observed pH (Code H) 9.3%, lab and field pH discrepancy (code J) 12.7%, and abnormal sampler efficiency (code N) 23.3%.

3.1.3 Data Recovery

The expected number of data results is calculated by multiplying the number of samples submitted from all sites by 14 (the number of parameters per sample analysis). A total of 5,584 samples were collected during 1982-84. Therefore, 78,176 results are expected. Data recovery averaged 73.1% during the 1982-84 period, with seasonal recoveries averaging 79.6% in the summer (May to October) and 67.0% in the winter (November to April). Compared to the data recovery calculated during 1980-1981 (72.7%) a slight improvement of 0.4% was observed during 1982-1984. This improvement, however small, needs to be interpreted in light of the change during the fall of 1982 from using the SES (Sudbury Environmental Study) collector during the winter sampling period to using the wet-only Aerochem Metric collector year round. Figure 8 shows the data recoveries for individual sites during 1982-84.

During the 1980-81 sampling period, a difference of 6% in data recovery was observed between the Aerochem Metric sampler and the SES bulk sampler (70% Aerochem Metric compared to 76% SES). Because of the SES sampler's larger opening (large polyethylene container), and the impossibility of loss of sample due to mechanical inefficiencies, higher data recoveries were found for the SES collector, mainly because of the larger sample volumes collected in this collector.

Switching to the Aerochem Metric collector should therefore have resulted in lower data recoveries during the winter sampling period. During 1982, the SES collector was used in the spring only, therefore the 1982 winter data recovery is not representative. During 1983 and 1984, the seasonal data recoveries respectively for these years were 80% and 77% for the summer, with 62% and 63% recoveries for the winter. The data recovery did decrease for the sampler change during the winter sampling period with about a 13% loss of data (76% - 63%). However, at the same time due to improvements in analytical techniques after 1981,

complete sample analyses were possible on smaller volume samples. Data analysts should bear in mind that there may be some bias (although small) for seasonal data between 1980-81 and subsequent years, because of fewer parameters were analysed during the winter season when most of the small samples are collected. Figure 9 shows the data recovery for each year broken down by parameter type. Field pH recoveries are low (30-40%) because analyses are carried out on a priority ranking when insufficient sample volume is collected.

3.1.4 Quality Assurance/Control

In the daily precipitation monitoring network, the following types of samples are used for QA/QC purposes: blank bags, composites, duplicates, field blanks, and co-located samples.

Blank Bags

As is done in the cumulative precipitation network, random sampling bags are removed from each region and submitted for analyses.

Table 10 shows the concentration percentiles of 15 blank bags submitted by various regional offices during 1984. The 50th percentiles (median) for all parameters were less than the detection limits ($<W$). For all parameters, except Cl^- and NH_4^+ , the 95th percentiles were also less than the detection limits. The 95th percentile for Cl^- was .04 mg/l which is just slightly above the detection criterion (T) value of .03 mg/l. The 95th percentile for NH_4^+ was .015 mg/l, again slightly above the detection criterion of .010 mg/l.

Composite Solution Handling

Composite precipitation samples are handled by site operators and submitted using standard operating procedures. The same composite preparation steps are used as those described under the cumulative composite handling section 2.1.4.

Table 11 shows the results of seven separate handling submissions carried out during 1983-84. For $\text{SO}_4^{=}$, NO_3^- , Ht^+ , Cl^- , Mg^{++} , lab pH, and Na^+ , the majority of handled results are within 1 or 2 standard deviations of the initial and final laboratory concentrations. Ca^{++} , K^+ , and NH_4^+ usually show good agreement for handled composites and are generally within 2 or 3 standard deviations of the initial concentrations. However, there are large changes (losses) in K^+ and NH_4^+ for the laboratory final concentrations. These final laboratory composites are not handled in the field network. They are stored at the laboratory and there is presently no explanation for these losses.

Based on these composite results, no attributable contribution or loss can be seen as a result of network protocols. However, it should be noted that composite solutions, being "aged", are inherently stable and do not represent conditions for "fresh" collected precipitation. Composite handling does however allow the ruling out of contamination introduced during sample collection and network processing.

Duplicate Sampling

Duplicate samples are obtained in the field whenever sufficient sample volume is collected to allow at least three samples to be analysed. Site operators will submit these duplicate samples by decanting the precipitation from the sample bag into three sample bottles. One sample is designated as the regular network sample and the remaining two samples are designated as the QA/QC duplicate samples. The absolute percentage differences (APD) are calculated by dividing the concentration difference between the two duplicates by their average concentration. The concentration percentiles of the APD's of all sites combined are shown in Table 12. Individual site duplicate data are provided in Appendix 5. A total of 129 duplicates were collected during the 1983-84 period.

The median (50th percentile) APD's of all parameters except Ca^{++} , K^+ and Na^+ were less than 10%. The median APD of Ht^+ , Hf^+ (lab and field), $\text{SO}_4^{=}$, NO_3^- and NH_4^+ were all less than 5% ($\text{SO}_4^{=}$ and NO_3^- median APD's were zero). The highest median APD's were Ca^{++} (17%), Na^+

(22%), and K^+ (40%). The 90th percentiles for Ht^+ , Hf^+ (lab), Hf^+ , (field), $SO_4^{=}$, and NO_3^- were all less than 15%.

Field Blank Sampling

Field blank bags in the daily precipitation network are collected by removing from the collector sample bags that have not been exposed to precipitation. These field blank bags could have been in the collector for any number of days but the average duration is from 3 to 5 days. After the bag is removed, it is heat sealed and submitted for laboratory analysis. The laboratory analysis is carried out by adding 250 millilitres of de-ionized distilled water to the bag and leaching for a 24 hour period. Note that during the 1983-84 period, 1 litre was initially used as the dilution volume. Approximately one half of the results shown have used 1 litre as the dilution volume. The 250 millilitre volume was implemented as a more appropriate dilution for daily samples.

Table 13 shows the results of analyses carried out on 61 field blanks during 1983-84. Dry deposition of $SO_4^{=}$, NO_3^- , Mg^{++} , and NH_4^+ was negligible. Approximately 15% of all field blanks do show minor contributions of Cl^- , K^+ , Ca^{++} and Na^+ . These contributions are usually small relative to field sample contributions.

Co-located Sampling

Overall sampling precision is determined by co-located instrumentation at one monitoring site in each of the five regions. The co-located collectors within each region are moved to a new monitoring site on average every 2 years. Table 14 shows the percentiles of the absolute percentage difference (APD) between two collectors for both concentration and deposition during 1983-84. Appendix 6 contains the same table for every co-located monitoring site. During 1983-84, 849 co-located samples were collected but due to incomplete analyses (arising from insufficient sample volume) and because of the screening of unreliable data, there are varying sample sizes for each parameter.

The median (50th percentile) APD for both $\text{SO}_4^{=}$ and NO_3^- was 4%. Ht^+ , Hf^+ (lab and field), and NH_4^+ all had a median APD that was less than 7%. Ca^{++} , Cl^- , and Mg^{++} had APD's less than or equal to 15%. The remaining two parameters, K^+ and Na^+ , had APD's of 34% and 22% respectively. The 75th percentiles show a similar pattern with $\text{SO}_4^{=}$ and NO_3^- APD's of 10%.

Gauge depths and sample volumes show very good agreement between co-located collectors with 50th percentile APD's of 0% (gauge depth) and 4% (sample volume). The 90th percentiles were 4% (gauge depth) and 30% (sample volume).

Deposition precision is also shown in Table 14 and the same patterns emerge with slightly higher absolute percentage differences. Both $\text{SO}_4^{=}$ and NO_3^- 50th and 75th percentile APD's were 7% and 17% respectively.

3.2 AIR SAMPLING

During the 1982-84 period, 3,747 daily air samples were collected. The following sections refer to daily air samples only. Appendix 9 contains site summary reports and a network summary report for the 1982-84 sampling period.

3.2.1 Field Observations

Field observations similar to those used in the cumulative air network are used in the daily air network.

During the 1982-84 period, 5.8% of all samples submitted had been affected by sampler malfunctions. This compares with 1.8% sampler malfunctions during the 1980-81 sampling period. Individual site malfunction frequencies were Longwoods (1.3%), Dorset (12.4%), Charleston Lake (4.0%) and Fernberg (5.5%). Upon closer inspection of the data listings reports, it is evident that there were a number of missing days with no data reported and no corresponding field sheet information indicating any sampler problem. A field sheet must be filled out for

any missing data due to a sampler malfunction or any other problem. The total number of days during 1982-84 in which missing days are not accounted for are: Longwoods-36, Dorset-46, Charleston Lake-67, and Fernberg-214.

Because of these missing days, the frequency of sampler malfunction codings are somewhat meaningless. In addition, many of the sampler malfunction codings from Dorset should not be appended. If a sampler malfunctioned and a multiple day sample is collected, the malfunction coding should be appended. At Dorset the technician is on-site and if the sampler does not automatically advance, the technician will manually advance the sampler. The collected sample is not affected in any way and the code should not be appended.

For the above reasons, the only true measurement of sampler performance is the percentage of valid data recovery at each site. This is based on the fact that less than 1% of data is invalidated due to a low sampling volume, and unreliable results are less than 1% at each site. The data recovery section is separately discussed under section 3.2.3. However, the data recovery for individual sites during 1982-84 was 91% (Longwoods), 84% (Dorset), 82% (Charleston Lake), and 65% (Fernberg).

Other field observations are relatively unimportant due to their infrequent usage (usually less than 1%).

3.2.2 Data Validation Codings

Data are invalidated (office comment code F) if an abnormal flow volume of less than 14,400 litres/day or greater than 43,200 litres/day is encountered. These limits are based on \pm 50% of the standard operating flow rate of 20 litres per minute. During 1982-84, less than 1% of submitted samples were invalidated using these limits.

Abnormal sampling periods (office comment Z) are periods in which a filterpack is sampled longer than 1 day. During 1982-84, this code was appended for 3% of all samples submitted.

Result remarks such as unreliable result (code U), not corrected for passive (code P), and the validation test codes for exceeding the Gross limit test (code G), or exceeding the Dixon ratio limit (code D), were infrequently appended with less than 1% of data coded during the 1982-84 period.

3.2.3 Data Recovery

Data recovery is defined as the percentage of sample results recovered from the expected total (assuming one sample should be collected every day from every site). Multiple-day sample results were not considered as data recovered since the objective of the network is to collect daily samples.

During 1982-84, an overall data recovery of 81% was obtained. Excluding data which are coded as unreliable or not passive corrected, data recovery is 79% over the three year period for the four sites. Individual site data recovery was 91% (Longwoods), 84% (Dorset), 82% (Charleston Lake), and 65% (Fernberg). Excluding data coded from validation procedures (V, P, F), recoveries decrease marginally about 1% at each site. Appendix 9 contains summary reports for each site.

The significantly lower data recovery from Fernberg is a result of the monitoring site location. While other sites are visited once per week by regional staff to load/unload filter packs and check the air sampler, the Fernberg site is only visited once every 4 to 6 weeks. Fernberg is located in Minnesota and has an on-site operator to load and unload filter packs on the tower. However, if the air sampler malfunctions, the technician from Thunder Bay must visit the site to repair or replace the instrument. This delay results in 1 to 2 weeks of downtime whenever problems occur.

Compounding the problem further was a period from 1983 to 1984 during which severe sampler sequencing problems began occurring across the entire network. These problems increased downtime at all sites and were only rectified after having the air sampler manufacturer investi-

gate and trouble-shoot the defect. Subsequently, all samplers have been repaired and modified to avoid the sequencing problem.

3.2.4 Quality Assurance/Control

Blank and Handling Filters

Filter blank and filterpack handling results collected during 1984 are shown in Table 15. Handling filters are filters which have been loaded into a filterpack and stored at a monitoring site for a one week period. All handling filter results were below the detection limit (W) except for HNO_3 and particulate NH_4^+ . These two parameters were not detected for the most part (70%), and when detected the loading was negligible.

For blank filters, no blank loadings were detected except SO_2 on the Whatman 41 filter. Some SO_2 loading was found on 20% of the Whatman 41 filters submitted. This loading, however, was again negligible with all results less than the detection criterion ($<T$).

Co-located Sampling

Overall precision of daily air monitoring was determined by co-locating a sampler at the Dorset site. Table 16 shows the concentration percentiles of the absolute percentage difference (APD) between the two samplers.

The median APD for particulate $\text{SO}_4^{=}$, NO_3^- and NH_4 was 11%, 22%, and 11% respectively. Sulphur dioxide determined by the sum of SO_2 on both the impregnated Whatman 41 and nylon filters had a mean APD of 17%. The median APD of SO_2 on the nylon filter alone was 47%, however, the majority of SO_2 was found on the Whatman 41 filters during this period (since the nylon filters used were of the earlier M8 stock type and collected little SO_2). Therefore the overall SO_2 precision closely resembles the precision of the Whatman 41 filters. Nitric acid (HNO_3) had a median APD of 14% using the nylon filter.

Other concentration percentiles (75th and 90th) show the same pattern except the APDs were higher. For example, the 75th percentiles for particulate $\text{SO}_4^{=}$ and NO_3^{-} were 36% and 41% respectively.

4.0 LABORATORY QUALITY CONTROL DATA

All samples in the deposition monitoring program are analysed at the Ministry's main laboratory located on Resources Road in Toronto by the Water Quality Section (WQ) and the Inorganic Trace Contaminants Section (ITC).

The following sections summarize the precision and accuracy of both sections for deposition monitoring parameters. Detailed performance reports for every parameter are attached as Appendices 7 (WQ) and 8 (ITC).

4.1 WATER QUALITY SECTION

In the Water Quality Section, calibrations are carried out using standardized solutions covering the range of instrument response. Calibrations are confirmed by using two quality control standards (QC-A and QC-B) which are made up and maintained independently of the calibration standards. The accuracy of laboratory measurements are represented by the percentage differences between the control standard concentrations and the mean concentrations obtained during calibrations. Table 17 provides a list of water quality parameters and the associated accuracies using control standard concentrations which best represent field concentrations.

For precision estimates, the observed differences from duplicate results were accumulated and sorted in the laboratory according to various concentration ranges. The coefficient of variation is determined by calculating the standard deviation of the observed differences and dividing by the midpoint of the most appropriate concentration range (compared to field concentrations). The coefficient of variation (COV), expressed as a percentage, is shown for every water quality parameter in Table 17.

In summary, precision estimates (COV) during the three year period ranged from a low of 0.9% (pH-1983) to a high of 16.9% (phosphorus).

Acid-base related parameters (hydrogen, sulphur and nitrogen compounds) were usually within 10%.

Accuracy estimates (percentage differences from QC standards) were usually better than precision estimates and the majority of parameters were within $\pm 5\%$.

4.2 INORGANIC TRACE CONTAMINANTS SECTION

The ITC section analyses cumulative precipitation and air samples for heavy metal concentrations. Aqueous samples with sufficient volume (≥ 100 mls) are analysed by preconcentration followed by the Inductively Coupled Argon Plasma (ICP) method. For samples with limited volume (< 100 mls), the Graphite Furnace Atomic Absorption Spectrophotometry (GFAAS) technique is used.

For the ICP method, two QC standards are carried through the concentration procedures and analyzed. Two filtered composites of cumulative samples are concentrated and analysed. The standard as well as the composite concentrations must be within ± 3 standard deviations of the mean values, otherwise samples are checked by GFAAS. Precision is calculated as the standard deviation of 3 duplicates per run at various concentration levels.

Quality control for the GFAAS method involves the analyses of calibration standards and two EPA (Environmental Protection Agency) solutions. Precision is calculated from the standard deviation of these two EPA solutions which are analysed with each set of standards.

Table 18 summarizes the precision and accuracy of the ICP and GFAAS methods during the 1982-84 period. Details of the QC results are found in Appendices 7 and 8. The precision of ICP and GFAAS methods are shown as coefficients of variation (%). For comparison purposes, the coefficient of variation is related to the ratio of the absolute percentage difference to the mean (as discussed under overall sampling precision) by the following:

$$\frac{C_1 - C_2}{(C_1 + C_2)/2} = \sqrt{2} \text{ COV}$$

ICP precision (COV) varies by parameter ranging from a low of 10% (Pb and Zn) to highs of 30% (Cd) and 40% (Ni). Precision with GFAAS ranged from 2% (Zn) to 32% (Cu). Comparison of the two methods varies according to parameter and concentration ranges.

Accuracy estimates are only available for the GFAAS method and are within $\pm 5\%$ for all parameters except Cu (+27%), Fe (+10%), and Pb (-6%).

It should also be noted that for many trace metal parameters, particularly Cd, Ni and V, concentrations are frequently observed at the method detection limits (W). Therefore, caution is needed when interpreting precision and accuracy percentages at these low concentrations.

5.0 SUMMARY

An assessment of the performance of the APIOS deposition monitoring networks was carried out for the 1982-84 sampling period. This assessment was based on field and data validation observations, data recovery, and quality assurance (QA) and quality control (QC) data. Laboratory QA/QC data related to the APIOS program were also included. The following points summarize these findings for both the cumulative and daily monitoring networks, during the 1982-84 sampling period.

Cumulative Precipitation Network

1. A total of 1363 cumulative precipitation samples were collected during 1982-84.
2. An average of 15.8% of all collected samples were affected by sampler malfunctions or other related problems which could affect sample representativeness. This represents an improvement of approximately 7% compared to the 1980-81 sampling period.
3. An average of 15.2% of all samples leaked or spilled. This compares to 20.7% leaks or spills occurring during 1980-81.
4. The average collection efficiency was 71.6% (compared to 61.4% for 1980-81) with seasonal efficiencies of 74.7% for summer and 67.4% for winter.
5. Unreliable data determined by validation procedures was coded for 3.5% of all sample results (compared to 5.3% for 1980-81).
6. Data recovery averaged 91.9% (compared to 83.4% for 1980-81) with an average of 75.2% valid data recovery (no malfunction codings or validation codings appended).
7. Blank bags and composite handling solutions show that no contributions of contamination are evident from network sampling protocols.

8. Overall precision estimates from co-located sampling show major acid-base parameters (total H^+ , free H^+ , $SO_4^{=}$, NO_3^-) are precise within $\pm 10\%$. Other parameters varied in their precision with phosphorus as the least precise parameter ($\pm 40\%$).

Cumulative Air Sampling Network

1. A total of 857 air samples were collected.
2. An average of 7.8% sampler malfunctions occurred. The major cause of malfunctions was vacuum pump failure.
3. Approximately 6% of all samples were invalidated due to abnormally low or high flow volumes.
4. An average of 2.2% sample results were coded as unreliable or exceeding the Dixon ratio test.
5. Data recovery averaged 92%, while 87% was considered valid data recovered.
6. Blank Whatman 40 filters had high Cl^- and Cd loadings compared to field loadings. Other filter types showed no significant blank loadings.
7. Handling filterpack results indicated handling and storage protocols are not affecting data quality.
8. Overall precision estimates from co-located sampling show the majority of parameters to be precise within $\pm 15\%$.

Daily Precipitation Network

1. A total of 5,584 precipitation samples were collected.
2. An average of 14% of all collected samples were affected by sampler malfunctions and other related sampling problems. This

compares to 11% during 1980-81, with the increase due primarily to using the Aerochem-Metric collector year round rather than only during the summer months.

3. An average collection efficiency of 79% was observed with seasonal efficiencies of 85% (summer) and 71% (winter).
4. Approximately 7% of all reported data were flagged during the data validation procedure with unreliable codings accounting for 4% of the total.
5. Data recovery averaged 73% with seasonal recoveries of 80% (summer) and 67% (winter).
6. Blank bag results and composite handling solutions show no major contribution or contamination from network protocols.
7. Field blank results show minor contributions (in 15% of all submitted blanks) of Cl^- , K^+ , Ca^{++} and Na^+ ; however, the concentrations are usually small relative to field sample concentrations.
8. Precision estimates for major acid-base parameters ($\text{SO}_4^{=}$, NO_3^- , H_2T^+ , Hf^+ , NH_4^+) were within $\pm 10\%$. The soil related parameters Ca^{++} , Cl^- and Mg^{++} were precise within $\pm 15\%$, while K^+ and Na^+ precision were $\pm 34\%$ and $\pm 22\%$ respectively.

Daily Air Sampling

1. A total of 3,747 daily air samples were collected.
2. 6% of all samples submitted were affected by sampler malfunctions. This compares to 2% during the 1980-81 period. The increase is due to aging samplers and electronic component problems.
3. Data recovery averaged 81%. Individual site recoveries were Longwoods - 91%, Dorset - 84%, Charleston Lake - 82%, and Fernberg - 65%.

4. Validation codes resulted in less than 5% of samples flagged.
5. Blank filters and handling filter pack samples showed negligible loadings.
6. Precision determined by co-located sampling showed that most parameters were precise in the range of \pm 10% to 20%.

BB/RE1006

REFERENCES

1. APIOS - Daily Precipitation Chemistry Listings Reports.
1982 - Report # ARB-56-84-ARSP. API-002-84
1983 - Report # ARB-043-85-AQM. API-004-85
1984 - Report # ARB-247-85.
2. APIOS - Daily Ambient Air Concentration Listings Reports.
1982 - Report # ARB-75-84-ARSP. API-004-84
1983 - Report # ARB-108-85-AQM. API-021-85
1984 - Report # ARB-195B-85.
3. APIOS - Cumulative (28-day) Precipitation Chemistry Listings.
1982 - Report # ARB-74-84-ARSP
1983 - Report # ARB-063-85-AQM
1984 - Report # ARB-239-85.
4. APIOS - Cumulative Ambient Air Concentration Listings
1982 - Report # ARB-145-84-ARSP. API-013-84
1983 - Report # ARB-088-85-AQM. API-017-85
1984 - Report # ARB-195A-85.
5. APIOS - An Overview: The Event Wet/Dry Deposition Network (1st Revised Edition). Report # ARB-142-85-AQM.
6. APIOS - An Overview: The Cumulative Wet/Dry Deposition Network (2nd Revised Edition). Report # ARB-141-85-AQM
APIOS-024-85
7. APIOS - Data Validation Procedures, Cumulative Precipitation and Air Network - Internal Report - ARB.
8. APIOS - Quality Assurance Plan - APIOS Deposition Monitoring Program. Report # ARB-76-84-ARSP.
9. APIOS - Quality Assurance Manual: Deposition Monitoring Network Report # ARB-051-85-AQM.
10. APIOS - Data Validation Procedures, Daily Precipitation and Air Network - Internal Report - ARB.

TABLE 1
Daily Monitoring Site Names and Numbers

Station Name	Map Code #	Station Number	Operating Region
Melbourne	1	1021	Southwestern
Longwoods	2	1011	Southwestern
North Easthope	3	1031	Southwestern
Wellesley	4	2011	Southwestern
Raven Lake	5	3041	Central
Balsam Lake	6	3031	Central
Nithgrove	7	3021	Central
Dorset	8	3011	Central
*Whitman Creek	9	4041	Southeastern
Railton	10	4021	Southeastern
Charleston Lake	11	4011	Southeastern
*Graham Lake	12	4031	Southeastern
Forbes Twp	13	6081	Northwestern
Quetico Centre	14	6071	Northwestern
*Lac La Croix	15	6061	Northwestern
Fernberg	16	6051	Northwestern
Otter Island	17	6111	Northwestern

* No longer in operation

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TABLE 2

Cumulative Monitoring Site Names and Numbers

Station Name	Map Code #	Station Number	Operating Region
Colchester	1	1041	Southwestern
Merlin	2	1051	Southwestern
Port Stanley	3	1061	Southwestern
Wilkesport	4	1071	Southwestern
Alvinston	5	1081	Southwestern
Huron Park	6	1191	Southwestern
Waterloo	7	2021	Southwestern
Palmerston	8	1101	Southwestern
Shallow Lake	9	1091	Southwestern
*Milton	10	3051	Central
Uxbridge	11	3061	Central
Coldwater	12	3101	Central
Campellford	13	3081	Southeastern
*Kaladar	14	4051	Southeastern
Smith Falls	15	4061	Southeastern
Dalhousie Mills	16	4071	Southeastern
Golden Lake	17	4081	Southeastern
Wilberforce	18	3071	Central
Whitney	19	5091	Central
Dorset	20	3011	Northeastern
McKellar	21	5011	Northeastern
Mattawa	22	5031	Northeastern
Killarney	23	5021	Northeastern
Bear Island	24	5041	Northeastern
Gowganda	25	5061	Northeastern
Azure Lake	26	5151	Northeastern
Moonbeam	27	5071	Northeastern
*Attawapiskat	28	5081	Northeastern
Winisk	29	6101	Northeastern
Geraldton	30	6121	Northwestern
Dorion	31	6011	Northwestern
Quetico Centre	32	6071	Northwestern
Lac la Croix	33	6061	Northwestern
E.L.A.	34	6091	Northwestern
Ear Falls	35	6031	Northwestern
Pickle Lake	36	6041	Northwestern
Turkey Lake	37	5141	Northeastern
*Ramsey	38	5051	Northeastern
Otter Island	39	6111	Northwestern
*Nakina	40	6021	Northwestern

* No longer in operation

TABLE 3

Data Validation Flags by Site
Cumulative Precipitation Network, 1982-84

Site Name & Number	Sample Codes				Result Codes				
	# Samples Collected	% Cond.* Discrep.	% Ionic Bal. Discrep.	% Calc. vs. Observ. pH Discrep.	% Unreliable Result (U)	% Gross Limit (G)	% Dixon Ratio (D)	% Both (G & D)	TOTAL % Flagged (U,G,D,B)
Colchester 1	39	0	5.1	7.9	1.5	0.8	0.6	0.1	3.0
Merlin 2	39	2.6	5.1	10.3	2.9	0.1	0.9	0	4.0
Port Stanley 3	39	0	7.7	12.8	4.7	0.2	0.5	0	5.4
Wilkesport 4	39	0	0	5.3	3.8	1.1	2.3	0.6	7.8
Alvinston 5	39	0	5.1	10.3	7.0	0.7	0.5	0.5	8.6
Huron Park 6	38	0	7.9	5.4	6.3	1.4	0.4	0.1	8.2
Waterloo 7	39	2.6	5.1	8.1	4.0	0.4	0.2	0	4.6
Palmerston 8	39	2.6	2.6	8.1	4.7	1.4	1.1	0.3	7.4
Shallow Lake 9	39	5.1	2.6	5.1	0.9	0.7	0	0.1	1.7
Milton 10*	29	6.9	13.8	32.0	14.6	1.0	0.7	0	6.3
Uxbridge 11	39	7.7	7.7	10.8	5.1	1.0	0.8	0	6.9
Coldwater 12	39	2.6	7.7	12.8	2.6	0.7	0.7	0	4.0
Campbellford 13	39	0	5.1	11.1	3.1	0.5	0.9	0	4.4
Kaladar 14*	11	0	0	0	1.3	0	0	0	1.2
Smith Falls 15	39	2.6	5.1	16.7	7.0	1.0	2.3	1.1	11.4
Dalhousie Mills 16	39	0	2.6	10.3	4.4	2.3	3.8	0.8	11.3
Golden Lake 17	39	5.1	12.8	12.8	1.7	0.7	0.1	0	2.5
Wilberforce 18	38	7.9	10.5	10.5	0.5	0.6	0	0	1.0
Whitney 19	40	7.5	7.5	7.9	0.4	0.8	0.2	0.4	1.7
Dorset 20	39	0	5.1	5.1	0.3	0.1	0.6	0	1.0
McKellar 21	39	5.1	10.3	5.3	2.4	1.2	0.8	0.4	4.7
Mattawa 22	39	5.1	2.6	0	3.7	0.7	0.5	0	4.8
Killarney 23	39	0	0	0	2.1	1.0	0.5	0.2	3.8
Bear Island 24	38	7.9	10.5	5.6	2.1	1.1	0.7	0	4.0
Gowganda 25	38	10.5	10.5	12.5	2.3	1.2	1.0	0.4	5.0
Azure Lake 26	19	0	10.5	0	3.0	2.1	0.7	0.9	6.6
Moonbeam 27	39	0	0	5.4	2.8	1.5	0.4	0.1	4.8
Attawapiskat 28*	21	28.6	28.6	42.9	11.2	0.7	0	0	11.9
Winisk 29*	26	23.1	23.1	30.4	10.5	0.8	0	0	11.3
Geraldton 30	18	11.1	5.6	17.7	3.2	0.8	0.3	0.3	4.5
Dorion 31	38	7.9	7.9	8.1	1.8	0.8	0.5	0.4	3.5
Quetico Centre 32	40	7.5	5.0	15.8	1.3	0.5	0.2	0.1	2.1
Lac La Croix 33	39	7.7	7.7	24.2	5.0	0.7	1.3	0	7.0
E.L.A. 34	41	4.9	7.3	23.7	4.3	1.3	2.8	0	8.3
Ear Falls 35	42	9.5	4.8	31.6	3.7	0.8	1.1	0.3	5.8
Pickle Lake 36	38	18.4	15.8	22.9	3.1	1.0	1.0	0.2	5.2
Turkey Lake 37	18	0	0	5.6	1.0	1.3	3.5	1.0	6.8
Ramsey 38*	20	0	0	0	1.6	0	0.2	0	1.8
Otter Island 39	7	0	0	14.3	1.9	3.7	1.9	0	7.4
Nakina 40*	21	19.1	14.3	45.0	6.4	1.1	0	0.7	8.2

*Denotes site removed.

TABLE 4

Cumulative Blank Bag Samples - 1984
mg/l

Parameters	Concentration		Percentiles		Detection Limit <W	Detection Criterion <T
	25th	50th	75th	95th		
SO ₄ ⁼	.025	.025	.025	.025	.05	.07
NO ₃ ⁻	0	0	.005	.005	.01	.02
Ca ⁺⁺	.005	.005	.005	.010	.01	.04
Cl ⁻	.005	.010	.040	.080	.01	.03
Mg ⁺⁺	0	0	.005	.005	.005	.008
K ⁺	0	0	0	0	.005	.014
Na ⁺	0	0	.005	.030	.005	.020
NH ₄ ⁺	0	0	.005	.005	.005	.010

NOTE: (1) <W and <T limits as in effect during 1984

(2) <W result and <T results treated as follows:

<W = 0

<T = $\frac{1}{2}$ value of reported number

(3) n = 8 samples

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TABLE 5

Composite Precipitation Handling - Cumulative Network
1983-84

Parameter	Sub. # (Date)	Mean Lab Initial (S.D.)	Mean Handling (S.D.)	Mean Lab Final (S.D.)
LAB pH	1 Aug. '83	4.41 (.01)	4.42 (.06)	4.43 (.01)
	2 Mar. '84	4.57 (.02)	4.49 (.05)	4.63 (.04)
	3 Sept. '84	3.27 (0)	3.29 (.01)	3.27 (.01)
H_t^+	1	.064 (.001)	.065 (.001)	.059 (.001)
	2	.047 (.001)	.053 (.004)	.039 (.003)
	3	.527 (0)	.575 (.008)	.595 (.002)
$SO_4^{=}$	1	2.45 (0)	2.55 (.03)	2.43 (.03)
	2	1.75 (0)	1.78 (.04)	1.75 (.05)
	3	3.40 (0)	3.51 (.01)	3.48 (.03)
NO_3^-	1	.35 (0)	.37 (.01)	.33 (.01)
	2	.17 (.02)	.27 (.01)	.01 (.02)
	3	.51 (0)	.49 (.003)	.41 (.03)
Cl^-	1	.24 (.03)	.22 (.01)	.18 (0)
	2	.09 (.01)	.13 (.03)	.10 (.01)
	3	.19 (.02)	.17 (.01)	.17 (0)
Ca^{++}	1	.29 (.01)	.25 (.02)	.25 (.01)
	2	.20 (.01)	.19 (.05)	.19 (0)
	3	.32 (.01)	.34 (.05)	.34 (.01)
Mg^{++}	1	.040 (0)	.032 (.004)	.038 (.003)
	2	.025 (0)	.030 (.003)	.015 (.005)
	3	.045 (.005)	.040 (.015)	.028 (.007)
Na^+	1	.248 (.003)	.257 (.013)	.243 (.003)
	2	.053 (.003)	.083 (.021)	.055 (.005)
	3	.080 (.010)	.076 (.011)	.072 (.003)
K^+	1	.045 (.005)	.043 (.009)	.028 (.003)
	2	.005 (.003)	.021 (.008)	.002 (.002)
	3	.090 (0)	.089 (.024)	.002 (.003)

Each submission had approximately 10 stations participating.

TABLE 6

Colocated Sampling - Cumulative - Precipitation Network
1982-84

ABSOLUTE RELATIVE DIFFERENCE $(C1-C2)/[(C1+C2)/2]$

Parameters	N	Concentration Percentiles				N	Deposition Percentiles			
		25th	50th	75th	95th		25th	50th	75th	90th
Ht ⁺	42	0.0247	0.0544	0.1245	0.3080	42	0.0390	0.0661	0.1732	0.4752
Hf ⁺	41	0.0460	0.0920	0.1608	0.2519	41	0.0428	0.1000	0.1593	0.3320
SO ₄ ⁼	42	0.0175	0.0414	0.0870	0.1481	42	0.0088	0.0391	0.0746	0.1706
N-NO ₃ ⁻	42	0.0000	0.0382	0.0690	0.1161	42	0.0212	0.0404	0.0772	0.2592
Ca ⁺⁺	42	0.0377	0.0896	0.3592	0.5000	42	0.0330	0.0834	0.2060	0.5623
Cl ⁻	42	0.0000	0.1333	0.2222	0.4762	42	0.0352	0.1017	0.2268	0.4702
Kjeldahl-N	43	0.4444	0.0988	0.3333	0.6667	43	0.0540	0.1047	0.3248	0.7042
Mg ⁺⁺	43	0.0000	0.0779	0.4000	0.5484	43	0.0426	0.1322	0.3142	0.5157
Kk ⁺	38	0.1359	0.5352	1.2000	1.6923	38	0.1419	0.5492	1.2748	1.7701
Na ⁺	41	0.1538	0.3030	0.7500	1.2258	41	0.1206	0.2655	0.7585	1.1801
N-NH ₄ ⁺	43	0.0417	0.1053	0.2500	0.6786	43	0.0650	0.1279	0.3275	0.7000
Phosph.	42	0.1714	0.4000	0.7755	1.3333	42	0.1661	0.3466	0.7735	1.1831
Mn	41	0.0000	0.0000	0.4000	0.6667	41	0.0345	0.0867	0.3223	0.6714
Ni	41	0.0000	0.0000	0.0000	0.4000	41	0.0163	0.0575	0.2422	0.5971
Zn	2	0.0000	0.0007	0.0007	0.0007	2	0.0000	0.0009	0.0009	0.0009
Fe	38	0.1102	0.2486	0.5470	0.6924	38	0.0482	0.1862	0.3480	0.5941
Pb	19	0.0769	0.1926	0.2693	0.3991	19	0.0879	0.2045	0.3506	0.3956
Vv	41	0.0000	0.0000	0.0000	0.0000	41	0.0146	0.0515	0.1017	0.4038
Al	23	0.0807	0.1795	0.4567	0.6643	23	0.0541	0.1545	0.3546	0.6335
Cu	17	0.0037	0.0101	0.0674	0.3386	17	0.0083	0.0207	0.0649	0.2823
Cd	41	0.0000	0.0000	0.2857	0.6667	41	0.0212	0.0986	0.4251	0.7121
G-Depth ^a	31	0.0000	0.0426	0.0870	0.2174					
S-Depth ^b	43	0.0120	0.0515	0.1017	0.4038					

(a) Standard gauge depth

(b) Sampler depth

TABLE 7

Filterpack Handling and Filter Blank Results
Cumulative Air Network - 1982-86
µg/filter

Filter Type	Parameter	HANDLING FILTERS				BLANK FILTERS				Laboratory Limits	
		N	% results <W	Mean of results >W	S.D.	N	% results <W	Mean of results >W	S.D.	W	5W(T)
W40	SO ₄ ⁼	27	70	3.50	4.20	107	79	5.00	0.00	2.00	10.00
	NO ₃ ⁻	27	85	0.60	0.30	107	77	1.40	0.30	0.50	2.50
	Ca ⁺⁺	26	0	3.30	0.90	96	0	2.90	0.70	1.00	5.00
	Mg ⁺⁺	26	12	0.62	0.17	97	33	0.69	1.30	0.25	1.25
	Al	26	8	0.46	0.22	97	54	0.59	0.56	0.25	1.25
	Cd	26	0	0.018	0.005	97	6	0.010	0.006	0.001	0.005
	Cu	26	0	0.13	0.08	97	28	0.03	0.02	0.01	0.05
	Fe	25	0	1.05	0.60	97	2	0.92	0.70	0.05	0.25
	Mn	26	27	0.08	0.02	97	64	0.20	0.51	0.05	0.25
	Ni	22	9	0.08	0.07	97	44	0.04	0.07	0.01	0.05
	Pb	26	4	0.10	0.10	97	61	0.12	0.13	0.05	0.25
	V	26	39	0.09	0.06	97	63	0.02	0.002	0.02	0.10
	Zn	26	8	0.13	0.12	97	60	0.23	0.13	0.05	0.25
	Na ⁺	26	0	3.42	2.01	107	1	2.66	0.95	0.25	1.25
	K ⁺	25	28	1.48	1.39	103	47	1.16	1.50	0.25	1.25
	Cl ⁻	26	0	7.30	1.70	107	2	8.80	2.80	0.50	2.5
Nylon	SO ₄ ⁼	21	67	1.43	1.13	13	62	2.00	0.00	1.00	5.00
	HNO ₃	27	74	0.54	0.17	15	67	1.05	0.11	0.25	1.25
W41	SO ₂ (as SO ₄ ⁼)	32	100	-	-	32	91	3.35	0.00	1.00	5.00

NOTE: Trace metal differences in percentages of results <W for blank and handled filters are in part due to the inconsistent application of laboratory result codes. For example, results of .05<W and .05 are treated differently in that one is considered "zero".

TABLE 8

Colocated Sampling - Cumulative Air Sampling
1982-84

ABSOLUTE RELATIVE DIFFERENCE $(C1-C2)/[(C1+C2)/2]$					
Parameters	N	Concentration Percentiles			
		25th	50th	75th	90th
SO ₂	50	0.0551	0.1724	0.7167	1.2267
SO ₄ ⁼	47	0.0602	0.1136	0.3787	0.9724
HNO ₃	48	0.0674	0.1148	0.3813	1.2803
N-NO ₃ ⁻	47	0.0382	0.1123	0.4063	1.4340
Ca ⁺⁺	48	0.0705	0.1881	0.3340	1.0931
Cl ⁻	47	0.0246	0.1191	0.3416	1.0240
Kk ⁺	46	0.1259	0.3402	0.5712	1.0502
Na ⁺	48	0.0458	0.1302	0.3891	1.1313
Fe	48	0.0606	0.1546	0.4837	0.9633
Al	48	0.0755	0.2306	0.3823	0.9629
Mg	48	0.0745	0.1481	0.3982	0.9704
Pb	48	0.0754	0.2156	0.4887	1.0034
Mn	48	0.0787	0.1917	0.3226	0.9306
Cu	48	0.1699	0.3980	0.7163	1.3229
Ni	48	0.0966	0.4538	1.0562	1.6453
Vv	48	0.0318	0.1170	0.3937	1.0031
Zn	48	0.1169	0.2546	0.5227	1.2078
Cd	48	0.0843	0.2155	0.6241	1.4967

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TABLE 9

Data Validation Flags vs. Site, Daily Precipitation
Monitoring Network - 1982-84

Site (#)	# Samples Collected	% Unreliable Result (U)	% Exceed Gross Limit (G)	% Outlier Dixon Ratio (D)	% Flagged Both (G and D)	Total % Coded
Melbourne (1)	311	3.9	1.7	0.8	0.1	6.5
Longwoods (2)	373	5.0	1.6	1.2	0.2	8.0
North Easthope (3)	429	7.2	2.2	1.1	0.5	11.0
Wellesley (4)	393	5.2	1.8	0.6	0.1	7.7
Raven Lake (5)	450	4.2	2.3	0.9	0.2	7.6
Balsam Lake (6)	419	3.1	2.4	0.8	0.4	6.7
Nithgrove (7)	431	4.1	2.3	2.0	0.4	8.8
Dorset (8)	550	0.9	2.0	0.9	0.1	3.9
Whitman Creek (9)	233	3.2	1.1	0.6	0.1	5.0
Railton (10)	233	1.1	1.0	0.8	0.1	3.0
Charleston Lake (11)	344	1.9	1.0	1.0	0.1	4.0
Graham Lake (12)	356	5.7	2.4	0.8	0.4	9.3
Forbes (13)	364	3.0	1.9	0.5	0.2	5.6
Quetico Centre (14)	305	3.4	1.6	0.3	0.0	5.3
Lac la Croix (15)	111	2.7	1.0	0.9	0.0	4.6
Fernberg (16)	231	1.8	2.1	0.2	0.1	4.2
Otter Island (17)	51	0.0	0.0	0.0	0.0	0.0

RE1006-TAB

TABLE 10

Daily Blank Bag Samples - 1984
mg/l

Parameters	Concentration Percentiles				Detection Limit	Detection Criterion
	25th	50th	75th	95th	<W	<T
SO ₄ ⁼	0	0	.025	.025	.05	.07
NO ₃ ⁻	0	0	0	0	.01	.02
Ca ⁺⁺	0	0	.005	.010	.01	.04
Cl ⁻	0	0	.010	.040	.01	.03
Mg ⁺⁺	0	0	0	.005	.005	.008
K ⁺	0	0	0	.0025	.005	.014
Na ⁺	0	0	0	.0025	.005	.020
NH ₄ ⁺	0	0	.005	.015	.005	.010

NOTE: (1) <W and <T limits as in effect during 1984

(2) <W result and <T results are treated as follows:

<W = 0

<T = $\frac{1}{2}$ value of reported number

(3) n = 15 samples

RE1006-TAB

TABLE 11

Composite Precipitation Handling - Event Network
1983-84

Parameter	Sub. # (a)	Mean Lab Initial (S.D.)	Mean Handling (S.D.)	Mean Lab Final (S.D.) (b)
LAB pH	1	4.37 (.03)	4.44 (.06)	4.36 (.01)
	2	4.42 (.02)	4.40 (.10)	-
	3	4.32 (.02)	4.40 (.04)	4.18 (0)
	4	4.40 (.01)	4.44 (.05)	-
	5	4.14 (.03)	4.10 (.03)	4.06 (.01)
	6	4.17 (.02)	4.21 (.02)	-
	7	4.23 (.02)	4.21 (.05)	-
H_t^+	1	0.085 (.032)	0.060 (.006)	0.067 (.001)
	2	0.060 (.001)	0.063 (.003)	-
	3	0.067 (.001)	0.057 (.005)	0.078 (.001)
	4	0.059 (.001)	0.062 (.003)	-
	5	0.101 (.005)	0.093 (.003)	0.098 (.002)
	6	0.072 (.001)	0.075 (.002)	-
	7	0.081 (.001)	0.079 (.009)	-
$SO_4^{=}$	1	2.63 (.04)	2.72 (.12)	2.56 (.04)
	2	3.20 (0)	3.24 (.04)	-
	3	3.30 (0)	3.31 (.14)	3.30 (10)
	4	2.30 (0)	2.51 (.04)	-
	5	2.80 (.05)	2.79 (.05)	2.80 (0)
	6	2.98 (.03)	2.93 (.03)	-
	7	3.85 (0)	3.88 (.04)	-
NO_3^-	1	0.34 (0)	0.34 (.02)	0.25 (.01)
	2	0.49 (0)	0.48 (.01)	-
	3	0.35 (.01)	0.40 (.02)	0.33 (.04)
	4	0.33 (0)	0.33 (.02)	-
	5	0.56 (.01)	0.57 (.01)	0.47 (.02)
	6	0.34 (.02)	0.32 (.01)	-
	7	0.38 (.01)	0.39 (0)	-
Cl^-	1	0.23 (.01)	0.24 (.06)	0.22 (.03)
	2	0.23 (.02)	0.23 (.03)	-
	3	0.16 (.01)	0.16 (.02)	0.15 (0)
	4	0.10 (.01)	0.14 (.01)	-
	5	0.21 (.01)	0.21 (.02)	0.19 (.01)
	6	0.19 (.02)	0.16 (.01)	-
	7	0.14 (.01)	0.16 (.02)	-

Notes: (a) Submission dates were:

- | | |
|------------------|-------------------|
| 1. June 1983 | 5. July 1984 |
| 2. August 1983 | 6. September 1984 |
| 3. January 1984 | 7. December 1984 |
| 4. February 1984 | |

(b) Final analyses are available only for submissions 1,3 and 5

TABLE 11 (cont'd)

Parameter	Sub. # (a)	Mean Lab Initial (S.D.)	Mean Handling (S.D.)	Mean Lab Final (S.D.) (b)
Ca ⁺⁺	1	0.32 (.02)	0.32 (.06)	0.29 (.01)
	2	0.55 (.01)	0.54 (.05)	-
	3	0.48 (0)	0.46 (.04)	0.46 (.04)
	4	0.14 (.01)	0.21 (.02)	-
	5	0.15 (.01)	0.18 (.05)	0.13 (.05)
	6	0.21 (.02)	0.15 (.03)	-
	7	0.41 (.01)	0.43 (.02)	-
Mg ⁺⁺	1	0.045 (.007)	0.049 (.012)	0.035 (0)
	2	0.072 (.003)	0.090 (.005)	-
	3	0.075 (0)	0.090 (.008)	0.080 (.006)
	4	0.025 (0)	0.030 (.004)	-
	5	0.022 (.003)	0.015 (.006)	0.012 (.003)
	6	0.033 (.003)	0.028 (.004)	-
	7	0.053 (.003)	0.045 (.004)	-
Na ⁺	1	0.185 (.007)	0.195 (.024)	0.170 (0)
	2	0.200 (.028)	0.155 (.018)	-
	3	0.023 (.006)	0.038 (.011)	0.030 (.005)
	4	0.060 (0)	0.084 (.012)	-
	5	0.112 (.003)	0.128 (.007)	0.123 (.003)
	6	0.037 (.003)	0.024 (.008)	-
	7	0.073 (.003)	0.076 (.008)	-
K ⁺	1	0.040 (0)	0.047 (.018)	0.015 (0)
	2	0.057 (.020)	0.045 (.010)	-
	3	0.035 (0)	0.033 (.009)	0.008 (.006)
	4	0.007 (.001)	0.020 (.016)	-
	5	0.015 (0)	0.012 (.007)	0.004 (.001)
	6	0.045 (.005)	0.054 (.009)	-
	7	0.105 (.005)	0.084 (.010)	-
NH ₄ ⁺	1	0.213 (.001)	0.236 (.069)	0.001 (.001)
	2	0.315 (.018)	0.203 (.047)	-
	3	0.261 (.026)	0.311 (.030)	0.002 (0)
	4	0.293 (.001)	0.300 (.027)	-
	5	0.105 (.005)	0.136 (.026)	0.000 (0)
	6	0.062 (.018)	0.133 (.029)	-
	7	0.300 (.003)	0.304 (.030)	-

Notes: (a) Submission dates were:

- | | |
|------------------|-------------------|
| 1. June 1983 | 5. July 1984 |
| 2. August 1983 | 6. September 1984 |
| 3. January 1984 | 7. December 1984 |
| 4. February 1984 | |

(b) Final analyses are available only for submissions 1,3 and 5

TABLE 12

Duplicate Sampling - Daily Precipitation Network
1982-84

ABSOLUTE RELATIVE DIFFERENCE $(C1-C2)/[(C1+C2)/2]$							
Parameters	N	Concentration Percentiles					
		5th	25th	50th	75th	90th	95th
Ht ⁺	128	0.0000	0.0137	0.0227	0.0495	0.0938	0.1101
Field Hf ⁺	83	0.0000	0.0000	0.0230	0.0691	0.1379	0.2065
Lab Hf ⁺	129	0.0000	0.0230	0.0460	0.0691	0.1608	0.2519
SO ₄ =	128	0.0000	0.0000	0.0000	0.0308	0.0870	0.1176
N-NO ₃ ⁻	127	0.0000	0.0000	0.0000	0.0351	0.1000	0.1429
Ca ⁺⁺	126	0.0000	0.0000	0.1667	0.3333	0.6667	1.0000
Cl ⁻	126	0.0000	0.0000	0.0870	0.2857	0.7500	1.0588
Mg ⁺⁺	107	0.0000	0.0000	0.0690	0.4615	0.8000	2.0000
K ⁺	107	0.0000	0.0870	0.4000	1.5556	2.0000	2.0000
Na ⁺	106	0.0000	0.0000	0.2222	0.6667	1.6000	2.0000
N-NH ₄ ⁺	127	0.0000	0.0194	0.0426	0.0901	0.2400	0.3784

RE1006-TAB

TABLE 13

Daily Precipitation Network Field Blank Results
1983-1984

	SO ₄ ⁼	NO ₃ ⁻	Ca ⁺⁺	Cl ⁻	Mg ⁺⁺	K ⁺	Na ⁺	NH ₄ ⁺
n	61	61	61	61	60	61	61	61
Results <W	53	56	38	45	57	47	43	49
Results <W	0	2	14	5	1	6	9	0
Measurable Results*	8	3	9	11	2	8	9	12
Mean (mg/l)	0.15	0.04	0.02	0.06	0.015	0.019	0.029	0.016
Stand. Dev.	0.07	0.01	0.03	0.04	0	0.009	0.023	0.010
Mean Field Concentration Southeastern Ontario Sites (1982) mg/l	3.29	0.68	0.25	0.23	0.040	0.055	0.105	0.396

d - includes results with <T codings (for calculation of the mean, a value equal to $\frac{1}{2}$ of the detection limit was used)

<W - "zero", value reported is minimum measurable amount

<T - less than detection criterion

RE1006-TAB

TABLE 14

Colocated Sampling - Daily Precipitation Network
1982-84

ABSOLUTE RELATIVE DIFFERENCE $(C1-C2)/[(C1+C2)/2]$

Parameters	N	Concentration Percentiles				N	Deposition Percentiles			
		25th	50th	75th	95th		25th	50th	75th	95th
Ht ⁺	762	0.0202	0.0478	0.1044	0.2418	762	0.0334	0.0766	0.1849	0.4453
Field Hf ⁺	359	0.0230	0.0460	0.1150	0.2292	359	0.0253	0.0587	0.1352	0.3307
Lab Hf ⁺	789	0.0230	0.0691	0.1608	0.3865	789	0.0436	0.1027	0.2506	0.5816
SO ₄ ⁼	765	0.0110	0.0377	0.1012	0.2222	765	0.0253	0.0651	0.1686	0.3703
N-NO ₃ ⁻	752	0.0060	0.0408	0.0952	0.2500	752	0.0274	0.0703	0.1749	0.3862
Ca ⁺⁺	617	0.0513	0.1538	0.3448	0.6667	617	0.0574	0.1567	0.3817	0.7396
Cl ⁻	747	0.0377	0.1212	0.2857	0.5946	747	0.0546	0.1538	0.3426	0.6891
Mg ⁺⁺	599	0.0000	0.1333	0.4000	0.7692	599	0.0351	0.1508	0.4401	0.9080
K ⁺	601	0.0606	0.3415	0.7925	1.5000	601	0.0943	0.3634	0.7945	1.4584
Na ⁺	608	0.0476	0.2222	0.6000	1.1111	608	0.0794	0.2301	0.6139	1.2221
N-NH ₄ ⁺	654	0.0206	0.0632	0.1677	0.4561	654	0.0320	0.0855	0.2303	0.6295
G-Depth	843	0.0000	0.0000	0.0000	0.0364					
S-Depth	849	0.0150	0.0408	0.1111	0.2951					

RE1006-TAB

TABLE 15

Filterpack Handling and Filter Blank Results
Daily Air Network - 1984

Units : $\mu\text{g}/\text{filter}$

Filter Type	Parameter	HANDLING FILTERS				BLANK FILTERS				Laboratory Limits	
		N	% results <W	Mean results >W	S.D.	N	% results <W	Mean results >W	S.D.	W	5W(T)
Teflon	$\text{SO}_4^{=}$	14	100	-	-	1	100	-	-	2.0	10.0
	NO_3^-	14	100	-	-	1	100	-	-	0.5	2.5
	NH_4^+	13	69	0.08	0.08	1	100	-	-	0.10	0.50
Nylon	$\text{SO}_4^{=}$	14	100	-	-	4	100	-	-	1.0	5.0
	HNO_3	14	71	0.13	0.00	4	100	-	-	0.25	1.25
W41	SO_2 (as $\text{SO}_4^{=}$)	14	100	-	-	17	82	1.18	0	1.00	5.00

RE1006-TAB

TABLE 16

Colocated Sampling - Daily Air Network
Dorset, 1984

ABSOLUTE RELATIVE DIFFERENCE $(C1-C2)/[(C1+C2)/2]$					
Parameters	N	25th	Concentration 50th	Percentiles 75th	90th
SO ₂	248	0.0790	0.1715	0.3844	0.8595
SO ₄ ⁼	259	0.0397	0.1081	0.3644	0.9106
HNO ₃	257	0.0632	0.1353	0.2828	0.5185
NH ₄ ⁺	262	0.0440	0.1057	0.3374	0.9057
N-NO ₃ ⁻	98	0.0601	0.2240	0.4127	1.1735
SO ₄ ⁼ (nylon)	233	0.2378	0.4664	0.7506	1.2196

Note: The relatively low N for N-NO₃⁻ results from the high occurrence of <W values which must be excluded to avoid division by zero.

RE1006-TAB

TABLE 17

Summary of Water Quality Section
Precision and Accuracy, 1982-84

Parameter	Units	PRECISION						ACCURACY							
		Conc. Range	Coef. of Variation (%) (Average)						Conc. Standard	% Difference (Average)					
			n	1982	n	1983	n	1984		n	1982	n	1983	n	1984
Total H ⁺	mg/l	0 - 0.10	43	6.4	12	5.3	93	3.2	0.200	180	+6.5	145	+4.1	158	+1.5
Ca ⁺⁺	mg/l	0 - 0.40	62	11.8	11	6.5	67	5.4	0.20	91	0	46	+5.0	53	0
Cl ⁻ (precip)	mg/l	0 - 0.30	191	13.2	185	12.5	204	13.9	0.30	247	0	295	0	170	0
Cl ⁻ (Air)	µg/filter	0 - 15.0	-	-	-	-	6	5.4	15.0	-	-	-	-	22	+3.3
Conductivity	µS/cm	0 - 20.0	78	2.2	34	1.3	25	4.4	14.9	102	+15.4	65	+12.1	66	-1.6
									37.0 (1984)						
Mg ⁺⁺	mg/l	0 - 0.100	54	8.7	12	10.0	77	9.0	0.05	86	-8.0	44	-2.0	56	-2.0
NH ₄ ⁺	mg/l as N	0.100-0.500	-	-	-	-	62	2.5	0.20	-	-	-	-	50	-3.5
NO ₃ ⁻ (precip)	mg/l as N	0 - 0.400	151	4.9	137	7.0	137	7.9	0.40	251	0	320	-2.5	168	-2.5
NO ₃ ⁻ & HNO ₃ (air)	µg/filter as N	0 - 10.0	58	5.6	25	14.8	119	6.4	10.0	153	+3.0	77	+2.0	138	+1.0
Kjeldahl Nitrogen	mg,l as N	0 - 0.40	341	10.7	188	16.0	188	10.3	0.500	154	-1.0	143	+1.0	155	+1.4
pH	-	4.00 - 5.00	93	1.0	17	0.9	120	2.7	4.01	210	0	134	-0.3	162	0
Phosphorus	mg/l	0 - 0.040	420	15.0	233	16.9	256	11.1	0.0500	158	+0.6	141	-0.8	156	-1.2
K ⁺	mg/l	0 - 0.20	70	8.5	8	5.6	76	6.7	0.10	89	-10.0	46	0	51	-10.0
Na ⁺	mg/l	0 - 0.20	71	11.5	24	5.6	90	6.8	0.01	98	0	48	0	53	0
SO ₄ = (precip)	mg/l	0 - 2.00	90	4.3	96	4.4	103	3.9	2.00	242	-1.0	317	+0.5	170	+0.5
SO ₄ = (air)	µg/filter	0 - 50.0	62	9.5	29	3.6	113	5.7	50.0	141	+1.4	85	+2.4	136	+2.0
SO ₂ (air)	µg/filter	0 - 200.0	17	5.5	33	7.2	96	6.7	133.3	65	+0.8	89	+8.3	91	+1.0
		0 - 100.0 ('84)							66.7 (1984)						

TABLE 18

Summary of I.T.C. Precision and Accuracy
GFAAS and ICP Methods, 1982-84

Parameter	Units	PRECISION						ACCURACY - GFAAS Only		
		ICP			GFAAS					
		Conc. Range	N	Coeff. of Variation %	Conc.	N	Coeff. of Variation %	Conc. EPA Standard	N	% Difference
Al	mg/l	.019-.0475	37	16	.0126	38	23	.0120	38	+ 5
Cd	mg/l	0 - .0004	70	30	.0005	32	20	.0005	32	0
Cu	mg/l	0 - .0034	69	24	.0028	42	32	.0022	42	+27
Fe	mg/l	0 - .025	58	18	.0044	48	27	.0040	48	+10
Pb	mg/l	0 - .012	64	10	.0045	45	22	.0048	45	- 6
Mn	mg/l	0 - .0035	66	11	.0031	28	26	.0030	28	+ 3
Ni	mg/l	0 - .0007	53	40	.0063	26	22	.0060	26	+ 5
V	mg/l	0 - .0008	76	15	.0146	21	20	.0140	21	+ 4
Zn	mg/l	0 - .01	74	10	.0162	6	2	.0160	6	+ 1

RE1006-TAB

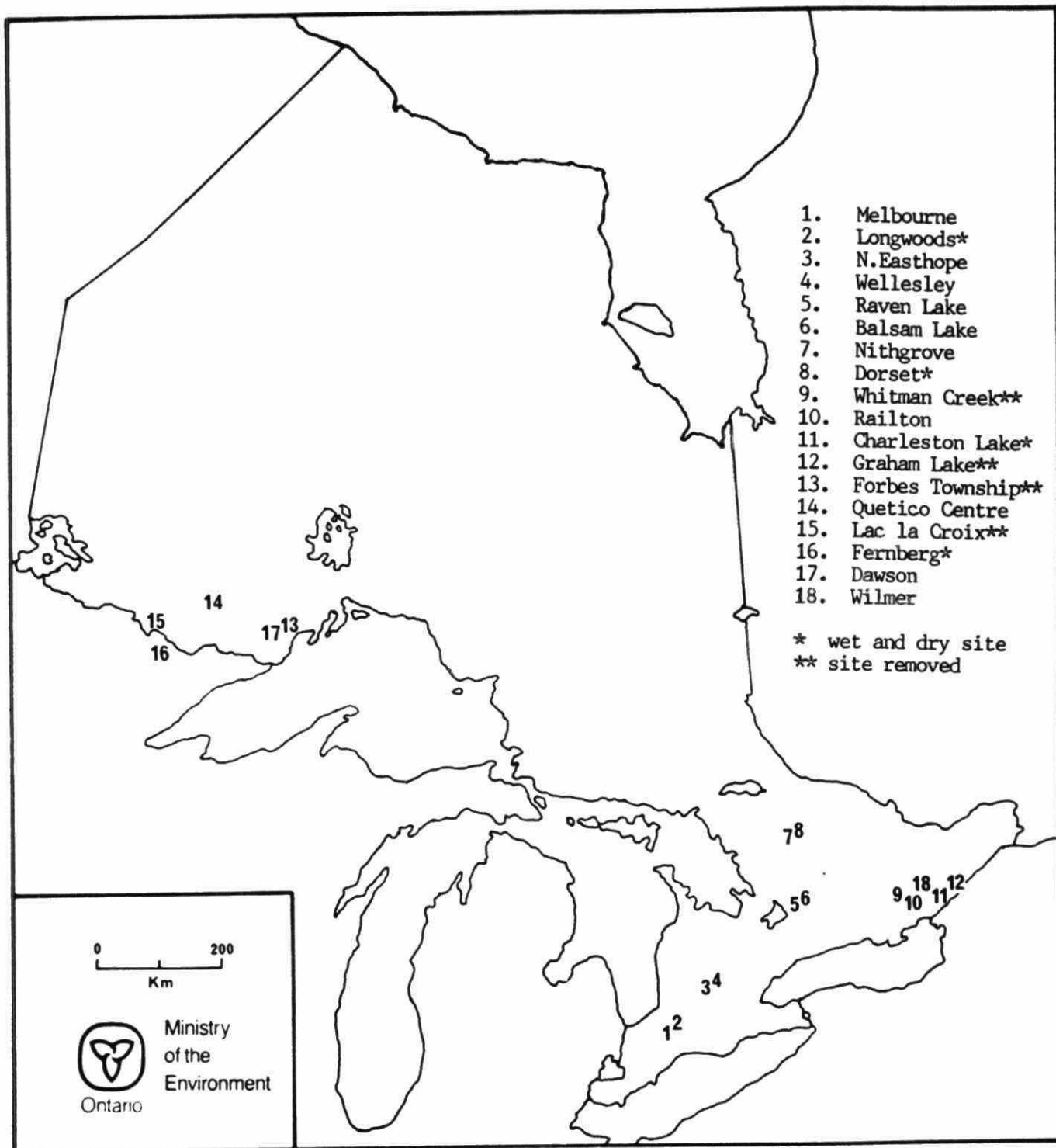
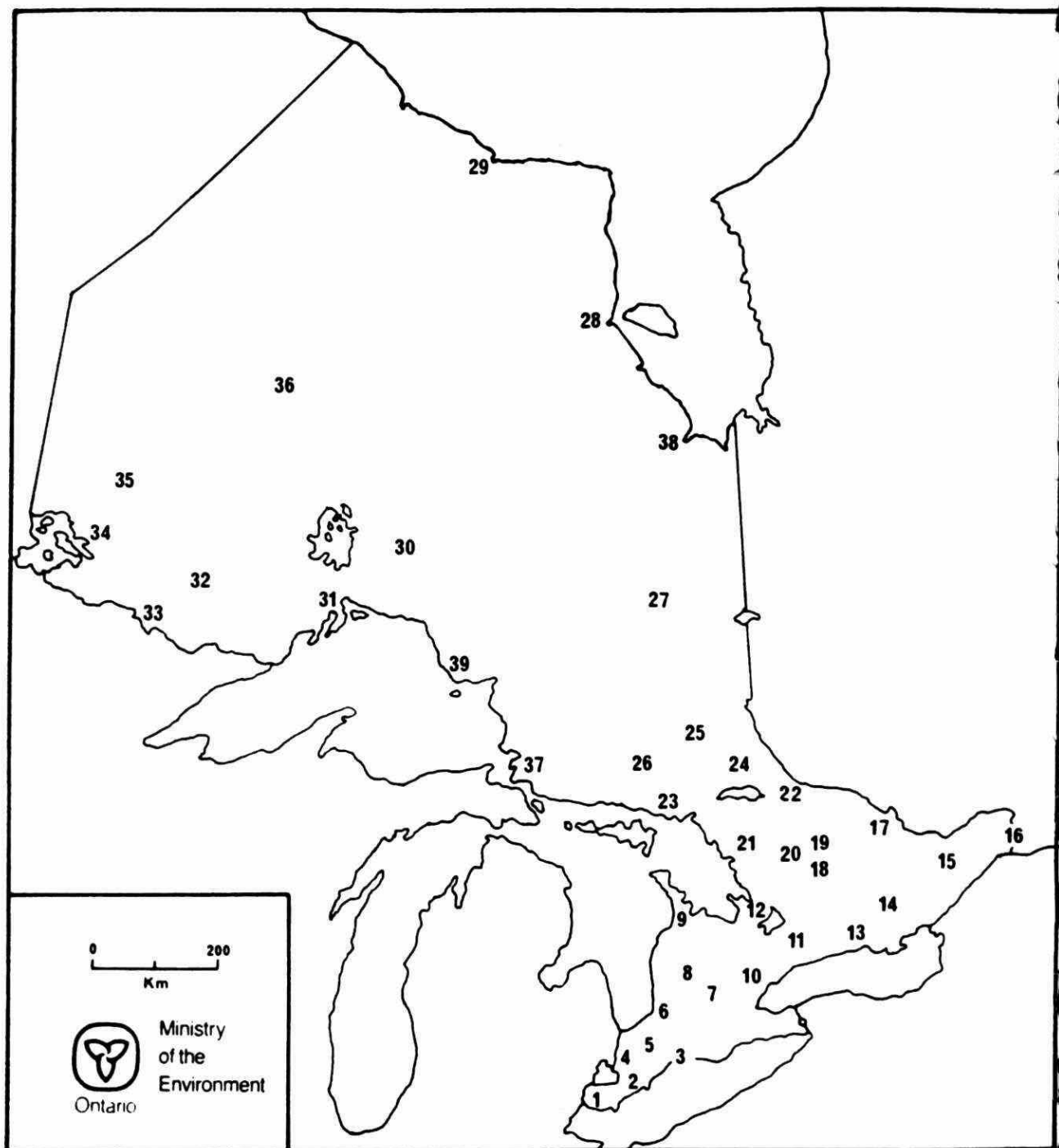


Figure 1. Daily Monitoring Network Site Map



- | | | |
|--|---|--|
| 1. Colchester* | 15. Smith's Falls* | 29. Winisk (rem. Dec '86) |
| 2. Merlin | 16. Dalhousie Mills* | 30. Geraldton (replaced Nakina, Aug '83) |
| 3. Pt. Stanley* | 17. Golden Lake* | 31. Dorion* |
| 4. Wilkesport* | 18. Wilberforce | 32. Quetico Centre* |
| 5. Alvinston | 19. Whitney | 33. Lac la Croix |
| 6. Huron Park | 20. Dorset* | 34. Experimental Lakes Area |
| 7. Waterloo | 21. McKellar* | 35. Ear Falls* |
| 8. Palmerston* | 22. Mattawa* | 36. Pickle Lake* |
| 9. Shallow Lake* | 23. Killarney* | 37. Turkey Lake* |
| 10. Milton (removed March '84) | 24. Bear Island | 38. Moosonee* (installed October '85) |
| 11. Uxbridge* | 25. Gowganda* | 39. Otter Island* (summer only) |
| 12. Coldwater | 26. Azure Lake (repl. Ramsey, June '83) | |
| 13. Campbellford* | 27. Moonbeam* | |
| 14. Cloyne* (repl. Kalladar, June '83) | 28. Attawapiskat (rem. Feb '84) | |

* indicates both a wet and dry deposition network site

Figure 2. Cumulative Monitoring Network Site Map

FIG. 3 CUMULATIVE PRECIP. NETWORK

Samples Affected vs Site , 1982-84

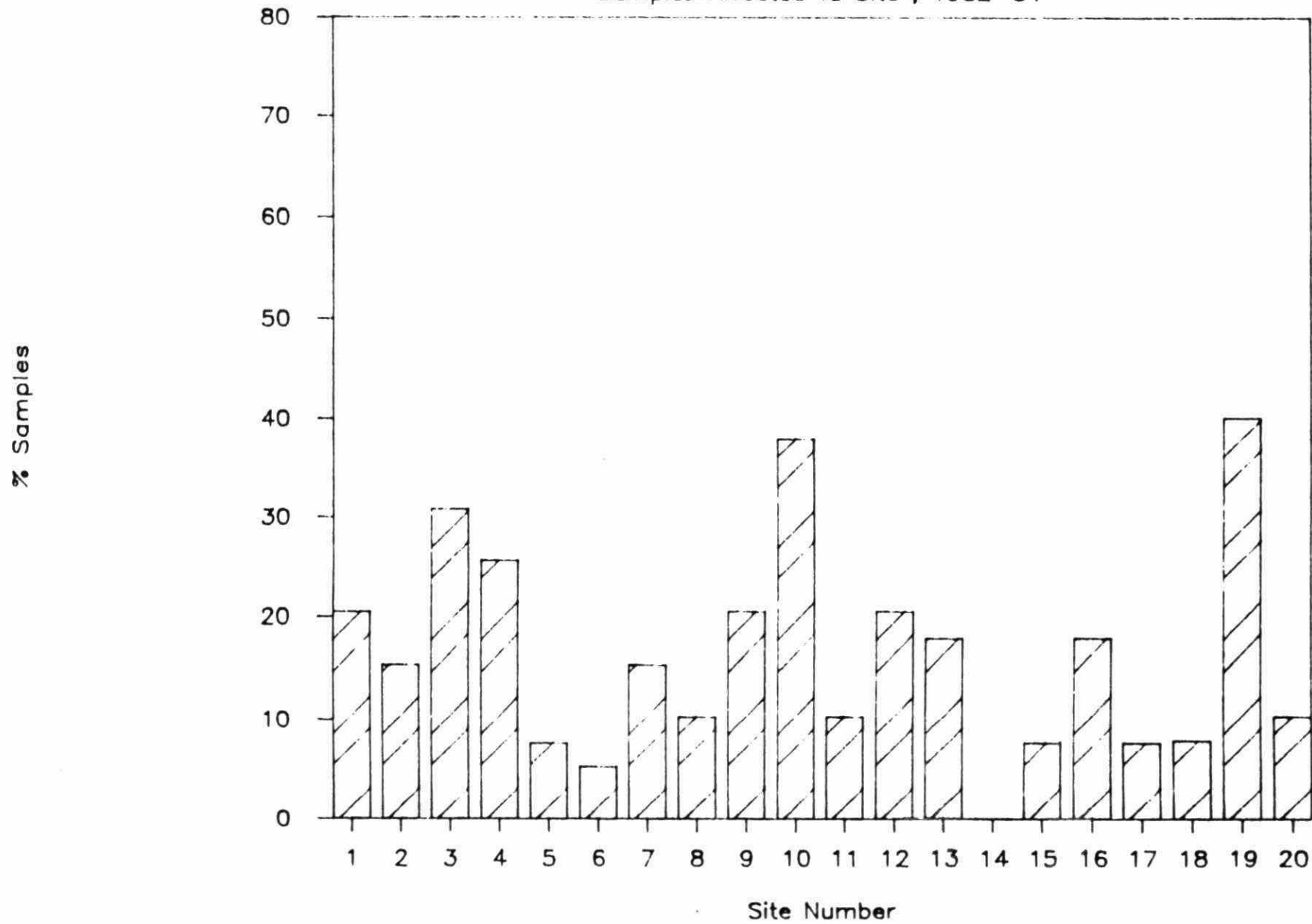


FIG. 3 (cont'd)

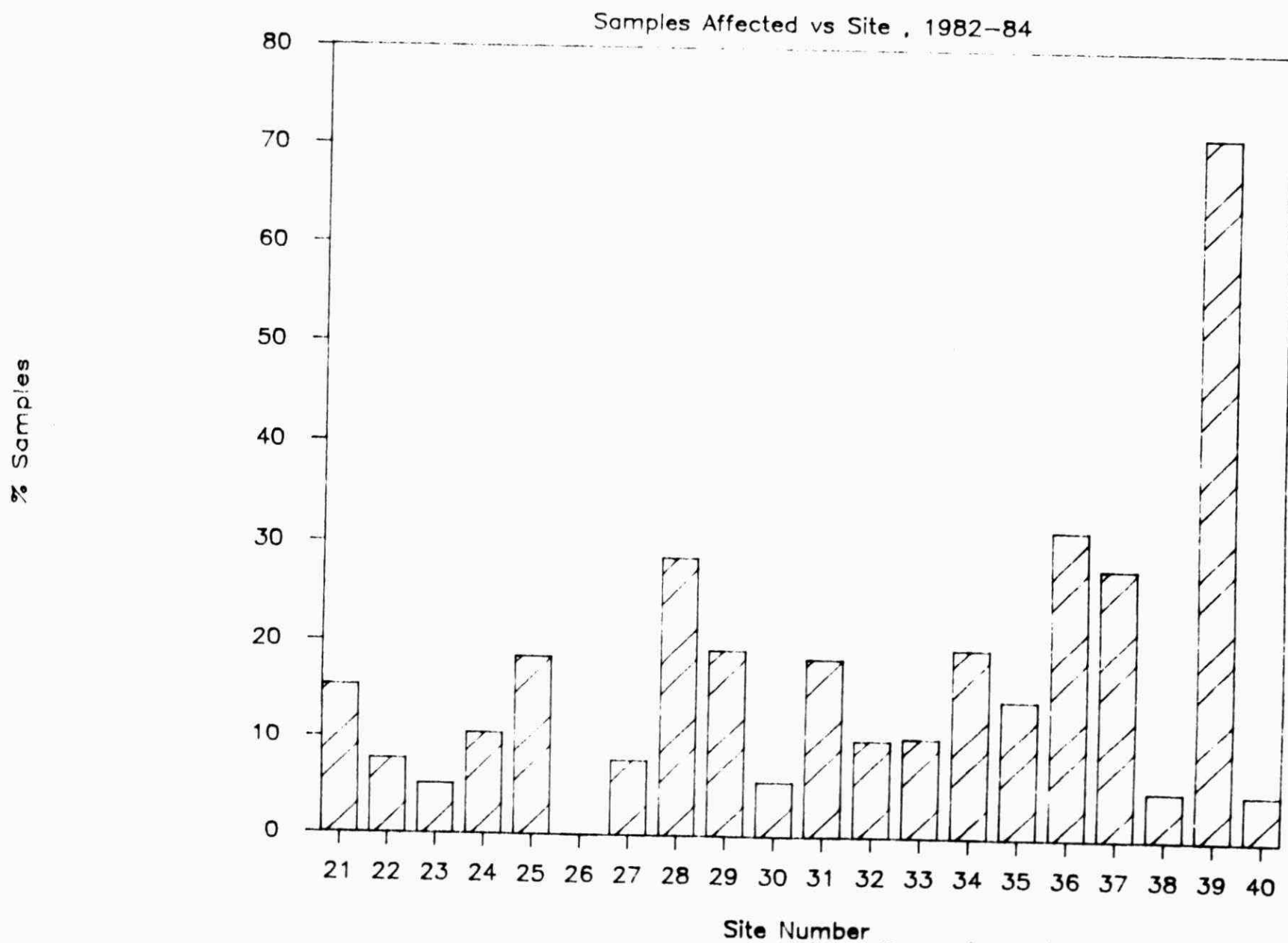


FIG. 4 CUMULATIVE PRECIP. NETWORK

Collection Efficiency vs. Site, 1982-84

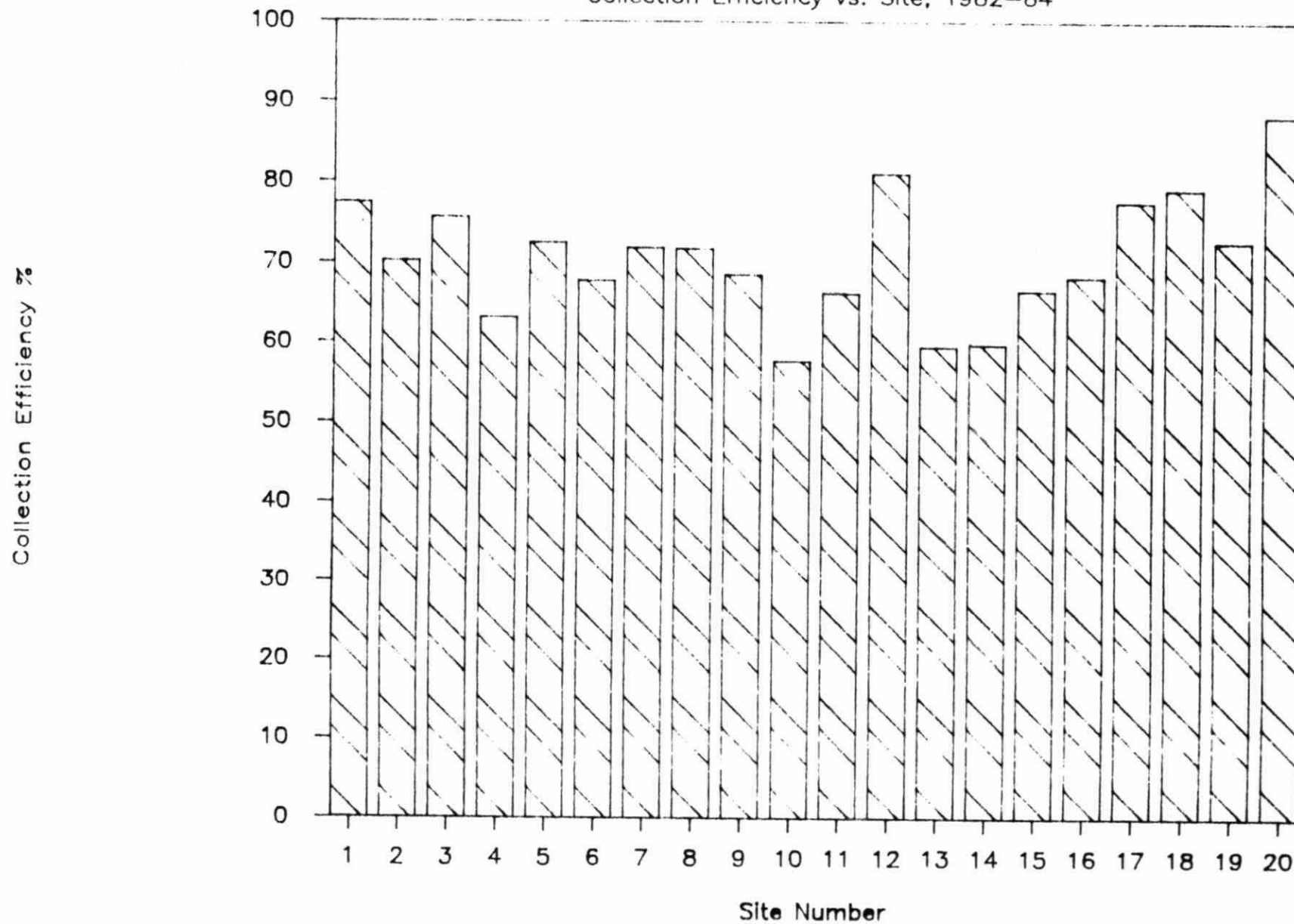


FIG. 4 (cont'd)

Collection Efficiency vs. Site, 1982-84

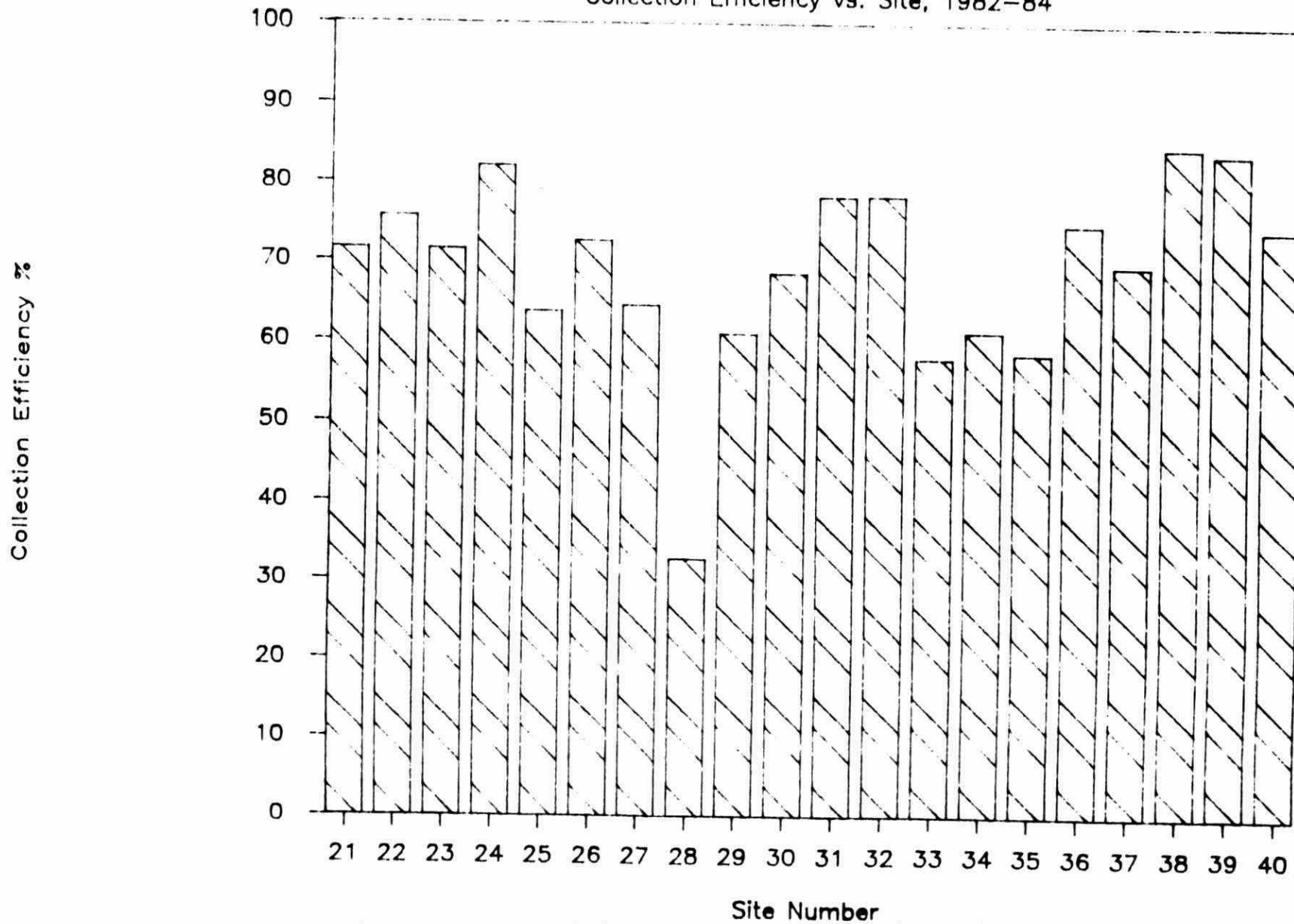


FIG. 5 CUMULATIVE PRECIP. NETWORK

Valid Data Recovery vs. Site, 1982-84

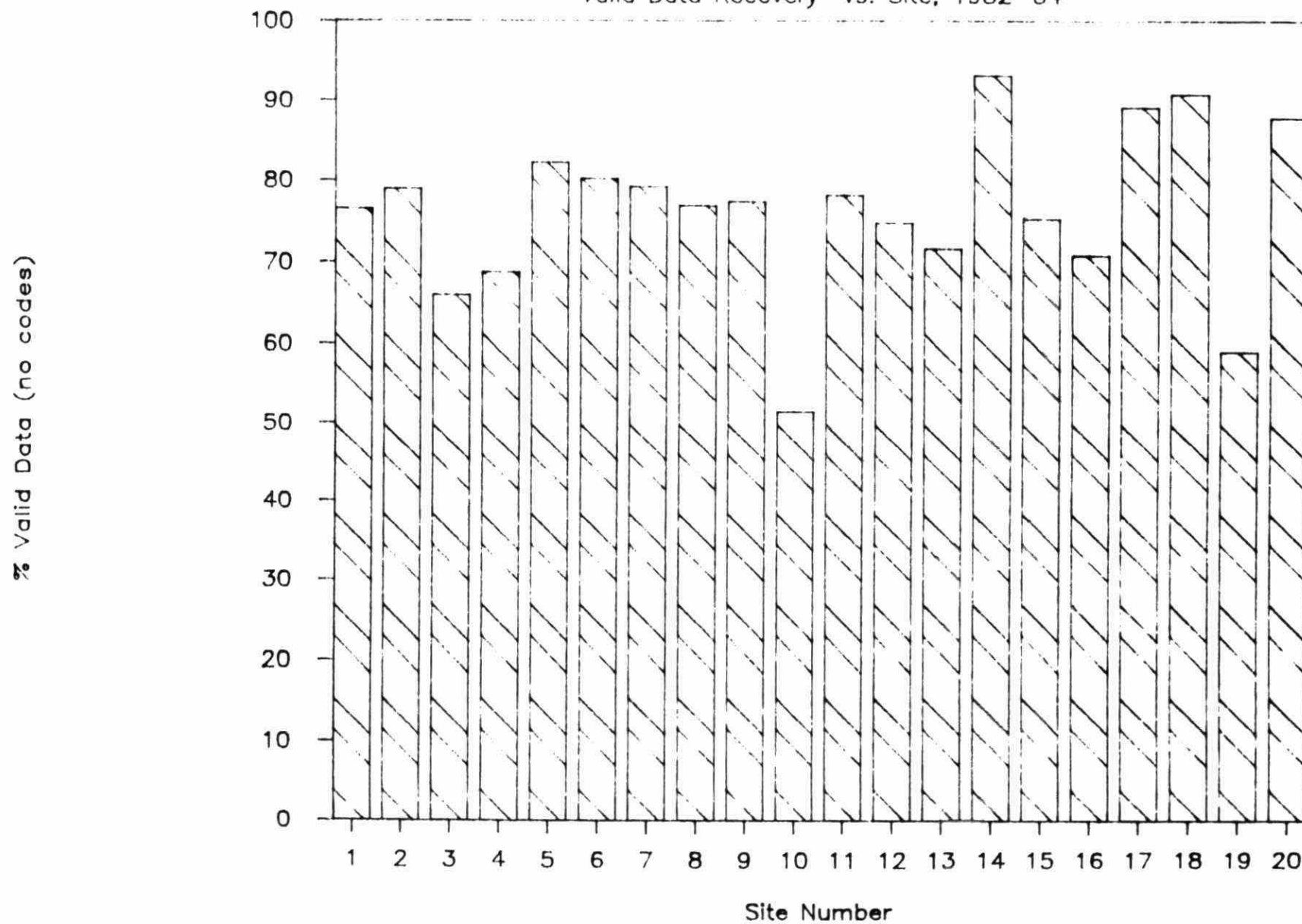


FIG. 5 (cont'd)

Valid Data Recovery vs. Site, 1982-84

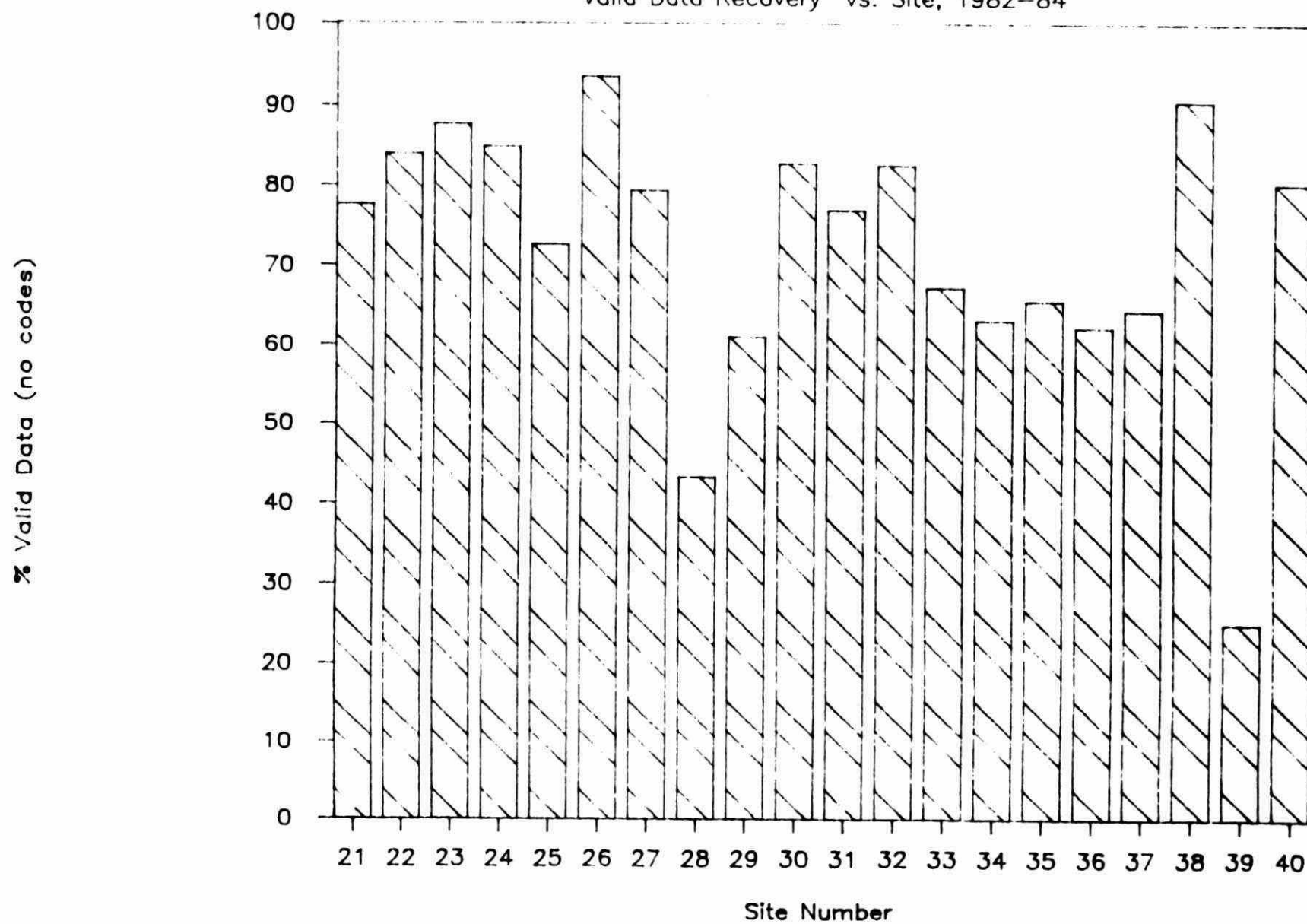


Fig 6. FIELD COMMENT CODINGS — DAILY PRECIP.

1982 — 1984

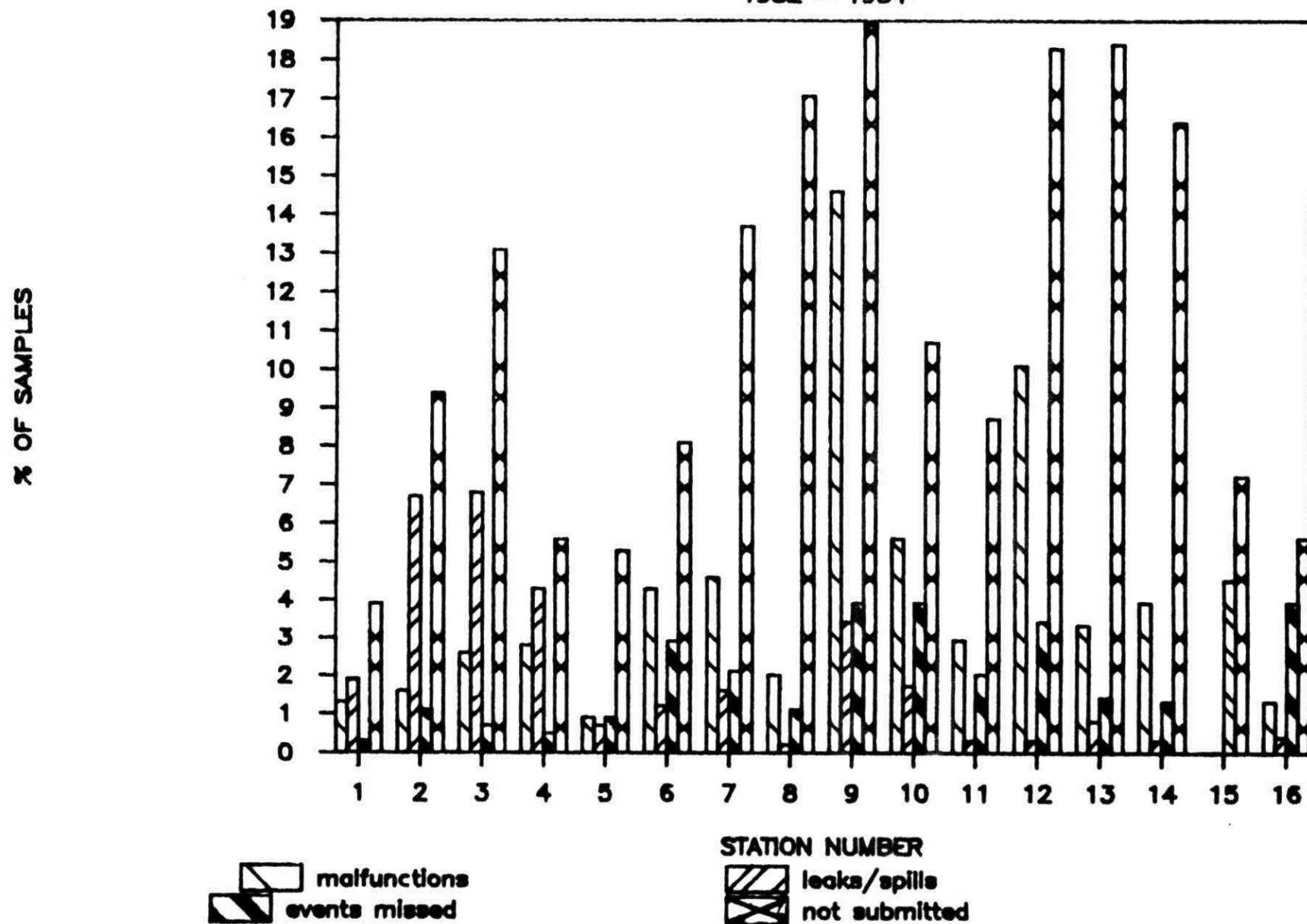
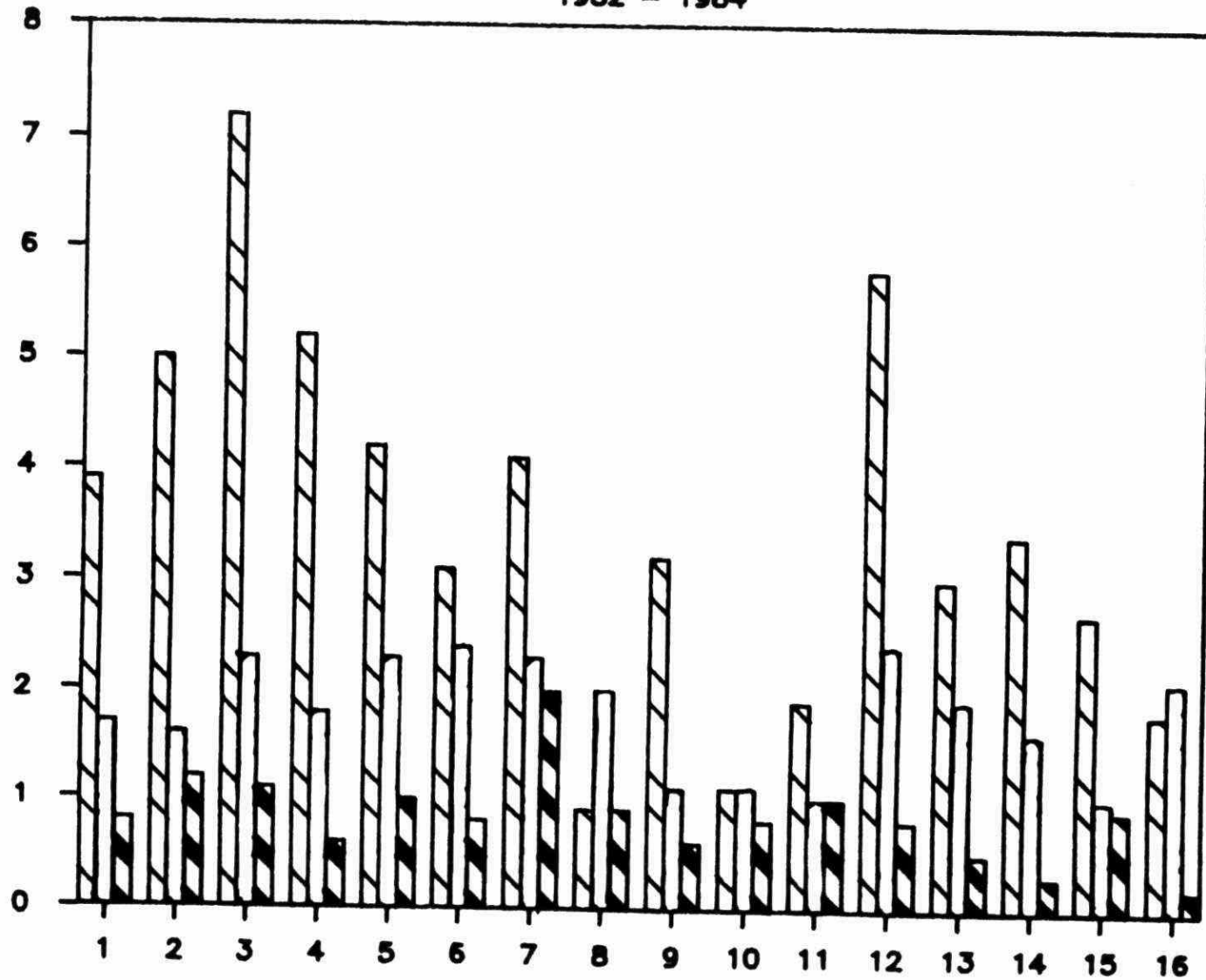


Fig.7 VALIDATION CODES — DAILY PRECIP.

1982 — 1984

% OF SITE ANALYSES



unreliable

gross limit

dixon ratio

SITE NUMBER

Fig 8. DATA RECOVERY — DAILY PRECIP.

1982 — 1984

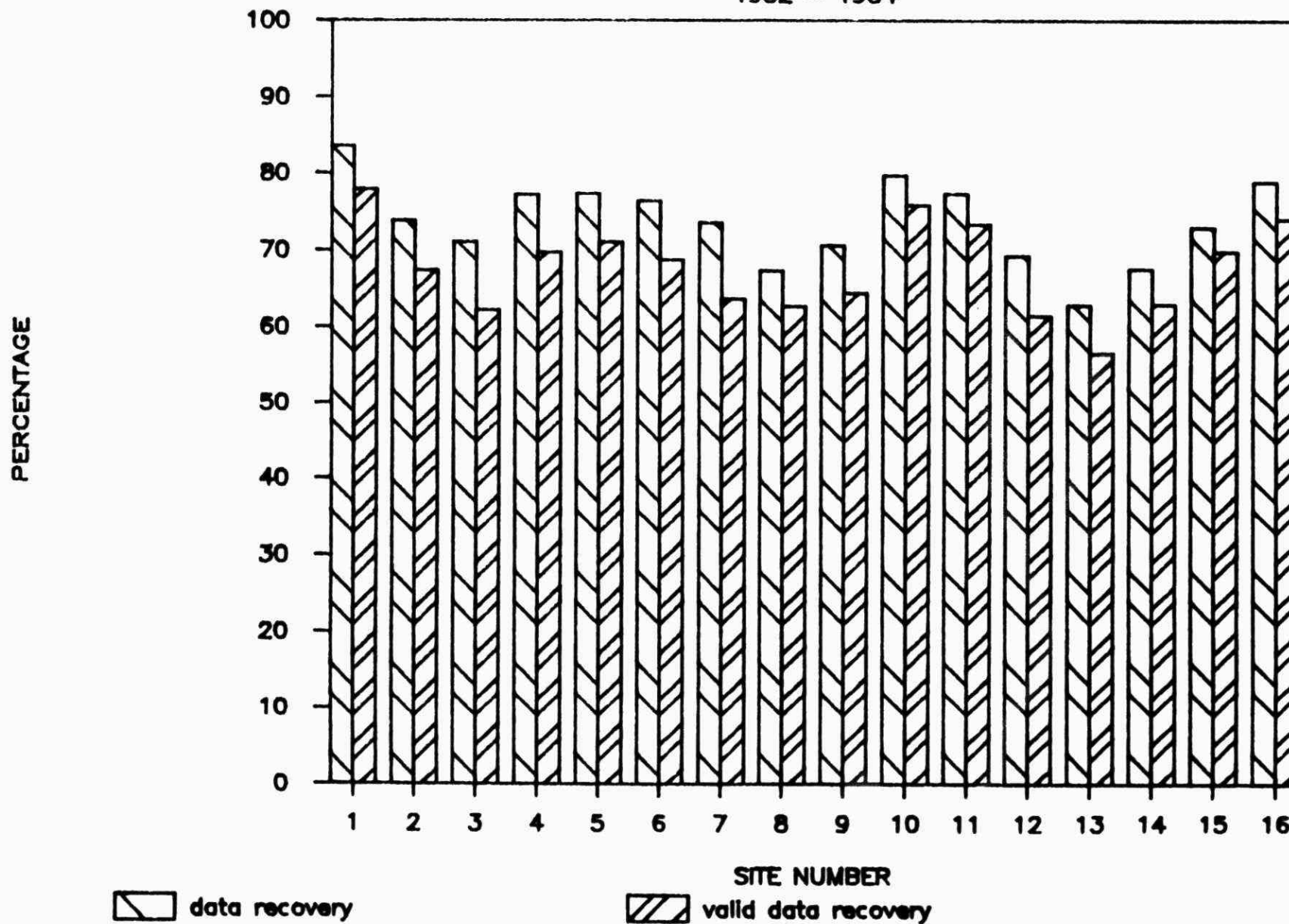
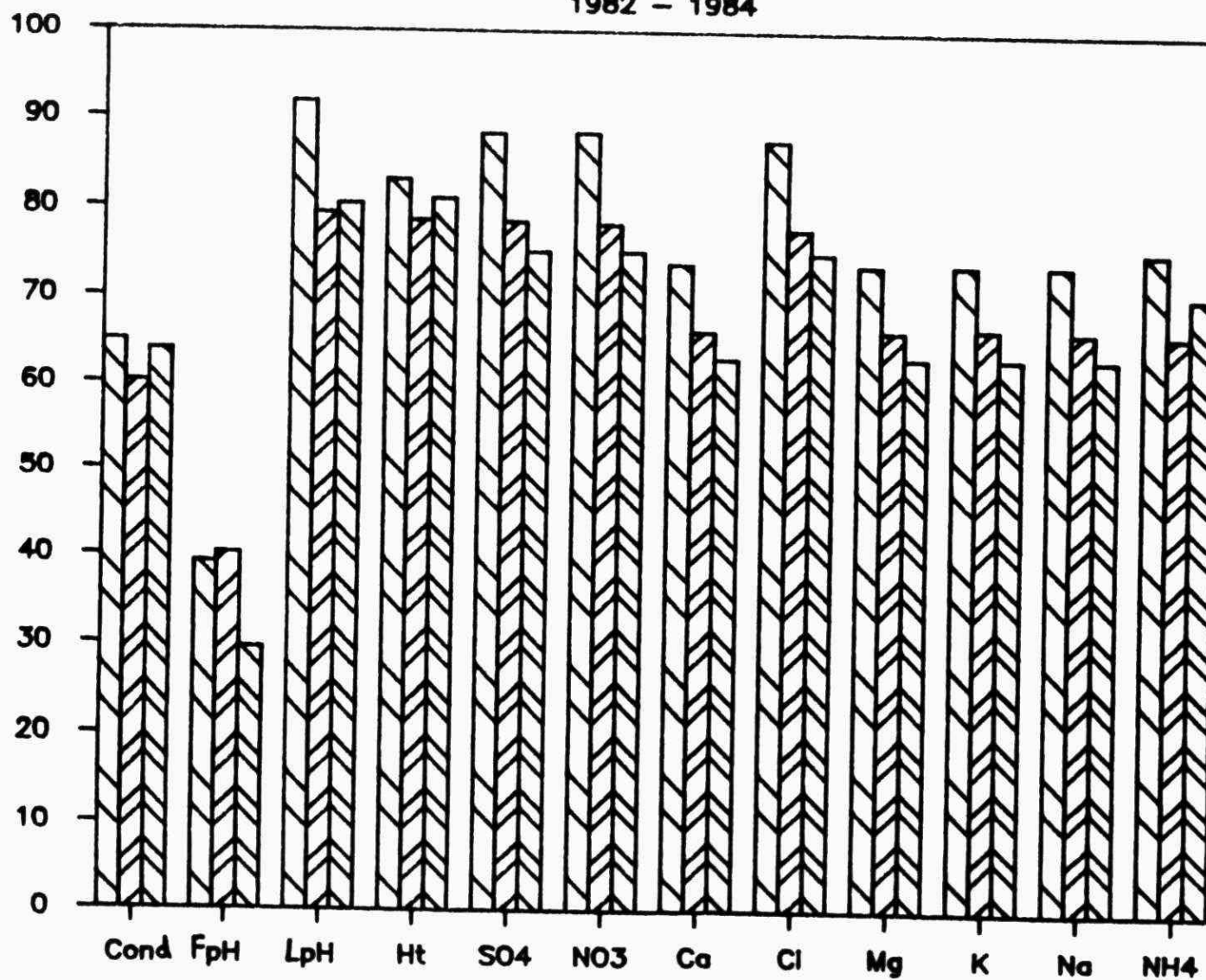


Fig. 9. PARAMETER DATA RECOVERY – DAILY PRECIP.

1982 – 1984

PERCENTAGE



PARAMETER

1982

1983

1984

APPENDIX 1

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : NETWORK
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 1363.
SAMPLES WITH FIELD COMMENTS : 941
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 409

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	284	20.8
LEAVES(B)	52	3.8
PARTICULATES(C)	551	40.4
FIBRES(D)	400	29.3
NOT SUBMITTED(E OR X)	25	1.8
MALFUNCTION(F)	163	12.0
SPILL/LEAK(G OR H)	207	15.2
EVENTS MISSED(I)	58	4.3
WET SIDE OPEN(J)	65	4.8
NO PRECIP. COLLECTED(K)	6	0.4
DRY SIDE OPEN(M)	13	1.0
OTHER IN SAMPLE(Q)	40	2.9
AFFECTED (F,I,J,K,L,M,X,E)	216	15.8
UNAFFECTED (NO F,I,J,K,L,M,X,E)	1147	84.2

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	1332	97.7
SAMPLES WITH VOLUME REPORTED	1329	97.5
SAMPLES WITH GDEP AND VOL	1300	95.4

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 71.6 %
STANDARD DEVIATION IS 20.8
N IS 1084.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 74.7 %
STANDARD DEVIATION IS 18.5 WITH N = 615
WINTER (NOV - APR) : 67.4 %
STANDARD DEVIATION IS 22.8 WITH N = 469

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 26.5 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 21.5 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 79.7 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 1363.
 TOTAL # ANALYTICAL RESULTS : 30071.
 TOTAL POSSIBLE # RESULTS : 32712.
 PERCENT OF DATA RECOVERY : 91.93 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 75.19 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 95.77 %
 WINTER (NOV - APR) : 87.37 %

PARAMETER DATA RECOVERY

VOLUME : 97.51 %	CONDUCT : 91.20 %	PH LAB : 95.23 %
TOTAL H+ : 91.56 %	SULPHATE : 95.52 %	NITRATE : 95.52 %
CALCIUM : 92.66 %	CHLORIDE : 95.30 %	KJELDAHL AS N : 91.71 %
MAGNESIUM : 92.81 %	POTASSIUM : 92.88 %	SODIUM : 92.96 %
MANGANESE : 93.62 %	AMMONIUM : 91.64 %	PHOSPHOROUS : 88.99 %
NICKEL : 88.99 %	ZINC : 88.99 %	IRON : 88.99 %
LEAD : 88.92 %	VANADIUM : 88.99 %	ALUMINUM : 88.99 %
COPPER : 88.99 %	CADMIUM : 88.99 %	FREE H+ : 95.23 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	71	5.21
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	95	6.97
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	157	12.10
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	212	16.31

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	1018	3.54
EXCEED GROSS LIMIT (G)	255	0.89
OUTLIER DIXON RATIO (D)	244	0.85
EXCEED (G) AND (D)	62	0.22
UNAFFECTED SAMPLES (NO RESULT CODE)	27163	94.51

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 1041 Colchester
PERIOD OF REPORT : 5 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 32
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 6

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	13	33.3
LEAVES(B)	1	2.6
PARTICULATES(C)	25	64.1
FIBRES(D)	14	35.9
NOT SUBMITTED(E OR X)	1	2.6
MALFUNCTION(F)	6	15.4
SPILL/LEAK(G OR H)	4	10.3
EVENTS MISSED(I)	1	2.6
WET SIDE OPEN(J)	4	10.3
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	1	2.6
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	8	20.5
UNAFFECTED (NO F,I,J,K,L,M,X,E)	31	79.5

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	38	97.4
SAMPLES WITH GDEP AND VOL	38	97.4

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 77.4 %
STANDARD DEVIATION IS 13.8
N IS 35.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 76.6 %
STANDARD DEVIATION IS 13.7 WITH N = 21
WINTER (NOV - APR) : 78.5 %
STANDARD DEVIATION IS 14.3 WITH N = 14

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 26.3 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 7.9 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 92.1 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 910.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 97.22 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 76.50 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 99.80 %
 WINTER (NOV - APR) : 94.21 %

PARAMETER DATA RECOVERY

VOLUME : 97.44 %	CONDUCT : 94.87 %	PH LAB : 97.44 %
TOTAL H+ : 94.87 %	SULPHATE : 97.44 %	NITRATE : 97.44 %
CALCIUM : 97.44 %	CHLORIDE : 97.44 %	KJELDAHL AS N : 97.44 %
MAGNESIUM : 97.44 %	POTASSIUM : 97.44 %	SODIUM : 97.44 %
MANGANESE : 97.44 %	AMMONIUM : 97.44 %	PHOSPHOROUS : 97.44 %
NICKEL : 97.44 %	ZINC : 97.44 %	IRON : 97.44 %
LEAD : 97.44 %	VANADIUM : 97.44 %	ALUMINUM : 97.44 %
COPPER : 97.44 %	CADMIUM : 97.44 %	FREE H+ : 97.44 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	2	5.13
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	3	7.89
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	3	7.89

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	13	1.49
EXCEED GROSS LIMIT (G)	7	0.80
OUTLIER DIXON RATIO (D)	5	0.57
EXCEED (G) AND (D)	1	0.11
UNAFFECTED SAMPLES (NO RESULT CODE)	846	97.02

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 1051 Merlin
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 26
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 9

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	6	15.4
LEAVES(B)	0	0.0
PARTICULATES(C)	21	53.8
FIBRES(D)	19	48.7
NOT SUBMITTED(E OR I)	0	0.0
MALFUNCTION(F)	4	10.3
SPILL/LEAK(G OR H)	0	0.0
EVENTS MISSED(I)	2	5.1
WET SIDE OPEN(J)	2	5.1
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	6	15.4
UNAFFECTED (NO F,I,J,K,L,M,X,E)	33	84.6

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	39	100.0
SAMPLES WITH GDEP AND VOL	39	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 70.2 %
STANDARD DEVIATION IS 21.7
N IS 39.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 70.7 %
STANDARD DEVIATION IS 21.0 WITH N = 21
WINTER (NOV - APR) : 69.6 %
STANDARD DEVIATION IS 23.1 WITH N = 18

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 15.4 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 17.9 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 82.1 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 891.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 95.19 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 78.85 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 95.04 %
 WINTER (NOV - APR) : 95.37 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 97.44 %	PH LAB : 100.00 %
TOTAL H+ : 94.87 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 97.44 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 97.44 %
MAGNESIUM : 97.44 %	POTASSIUM : 97.44 %	SODIUM : 97.44 %
MANGANESE : 100.00 %	AMMONIUM : 97.44 %	PHOSPHOROUS : 89.74 %
NICKEL : 89.74 %	ZINC : 89.74 %	IRON : 89.74 %
LEAD : 89.74 %	VANADIUM : 89.74 %	ALUMINUM : 89.74 %
COPPER : 89.74 %	CADMIUM : 89.74 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	1	2.56
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	2	5.13
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	4	10.26
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	6	15.38

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	25	2.93
EXCEED GROSS LIMIT (G)	1	0.12
OUTLIER DIXON RATIO (D)	8	0.94
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	818	96.01

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 1061 *Port Stanley*
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 33
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 10

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	9	23.1
LEAVES(B)	1	2.6
PARTICULATES(C)	21	53.8
FIBRES(D)	24	61.5
NOT SUBMITTED(E OR I)	0	0.0
MAFUNCTION(F)	10	25.6
SPILL/LEAK(G OR H)	2	5.1
EVENTS MISSED(I)	8	20.5
WET SIDE OPEN(J)	5	12.8
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	1	2.6
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	12	30.8
UNAFFECTED (NO F,I,J,K,L,M,X,E)	27	69.2

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	39	100.0
SAMPLES WITH GDEP AND VOL	39	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 75.6 %
STANDARD DEVIATION IS 16.4
N IS 37.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 76.4 %
STANDARD DEVIATION IS 13.4 WITH N = 20
WINTER (NOV - APR) : 74.6 %
STANDARD DEVIATION IS 19.7 WITH N = 17

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 33.3 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 12.8 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 89.7 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 907.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 96.90 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 66.03 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 98.02 %
 WINTER (NOV - APR) : 95.60 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 94.87 %	PH LAB : 100.00 %
TOTAL H+ : 94.87 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 97.44 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 97.44 %
MAGNESIUM : 97.44 %	POTASSIUM : 97.44 %	SODIUM : 97.44 %
MANGANESE : 97.44 %	AMMONIUM : 97.44 %	PHOSPHOROUS : 94.87 %
NICKEL : 94.87 %	ZINC : 94.87 %	IRON : 94.87 %
LEAD : 94.87 %	VANADIUM : 94.87 %	ALUMINUM : 94.87 %
COPPER : 94.87 %	CADMIUM : 94.87 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	3	7.69
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	5	12.82
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	4	10.26

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	41	4.72
EXCEED GROSS LIMIT (G)	2	0.23
OUTLIER DIXON RATIO (D)	4	0.46
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	821	94.59

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 1071 Wilkesport
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 31
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 5

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	11	28.2
LEAVES(B)	1	2.6
PARTICULATES(C)	25	64.1
FIBRES(D)	18	46.2
NOT SUBMITTED(E OR X)	1	2.6
MALFUNCTION(F)	9	23.1
SPILL/LEAK(G OR H)	4	10.3
EVENTS MISSED(I)	6	15.4
WET SIDE OPEN(J)	2	5.1
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	1	2.6
AFFECTED (F,I,J,K,L,M,X,E)	10	25.6
UNAFFECTED (NO F,I,J,K,L,M,X,E)	29	74.4

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	38	97.4
SAMPLES WITH VOLUME REPORTED	38	97.4
SAMPLES WITH GDEP AND VOL	37	94.9

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 63.1 %
STANDARD DEVIATION IS 21.4
N IS 34.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 65.1 %
STANDARD DEVIATION IS 20.4 WITH N = 18
WINTER (NOV - APR) : 60.9 %
STANDARD DEVIATION IS 23.0 WITH N = 16

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 29.7 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 21.6 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 78.4 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 871.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 93.06 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 68.80 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 91.67 %
 WINTER (NOV - APR) : 94.68 %

PARAMETER DATA RECOVERY

VOLUME : 97.44 %	CONDUCT : 89.74 %	PH LAB : 97.44 %
TOTAL H+ : 92.31 %	SULPHATE : 97.44 %	NITRATE : 97.44 %
CALCIUM : 94.87 %	CHLORIDE : 97.44 %	KJELDAHL AS N : 92.31 %
MAGNESIUM : 94.87 %	POTASSIUM : 94.87 %	SODIUM : 94.87 %
MANGANESE : 94.87 %	AMMONIUM : 92.31 %	PHOSPHOROUS : 89.74 %
NICKEL : 89.74 %	ZINC : 89.74 %	IRON : 89.74 %
LEAD : 89.74 %	VANADIUM : 89.74 %	ALUMINUM : 89.74 %
COPPER : 89.74 %	CADMIUM : 89.74 %	FREE H+ : 97.44 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	0	0.00
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	2	5.26
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	3	8.11

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	32	3.84
EXCEED GROSS LIMIT (G)	9	1.08
OUTLIER DIXON RATIO (D)	19	2.28
EXCEED (G) AND (D)	5	0.60
UNAFFECTED SAMPLES (NO RESULT CODE)	768	92.20

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 1081 Alvinston
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 27
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 7

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	8	20.5
LEAVES(B)	4	10.3
PARTICULATES(C)	24	61.5
FIBRES(D)	19	48.7
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	2	5.1
SPILL/LEAK(G OR H)	1	2.6
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	2	5.1
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	3	7.7
AFFECTED (F,I,J,K,L,M,X,E)	3	7.7
UNAFFECTED (NO F,I,J,K,L,M,X,E)	36	92.3

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	39	100.0
SAMPLES WITH GDEP AND VOL	39	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 72.5 %
STANDARD DEVIATION IS 18.7
N IS 38.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 71.4 %
STANDARD DEVIATION IS 18.8 WITH N = 21
WINTER (NOV - APR) : 73.9 %
STANDARD DEVIATION IS 19.0 WITH N = 17

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 10.3 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 10.3 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 89.7 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 901.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 96.26 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 82.16 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 97.82 %
 WINTER (NOV - APR) : 94.44 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 97.44 %	PH LAB : 100.00 %
TOTAL H+ : 92.31 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 94.87 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 94.87 %
MAGNESIUM : 94.87 %	POTASSIUM : 94.87 %	SODIUM : 94.87 %
MANGANESE : 97.44 %	AMMONIUM : 94.87 %	PHOSPHOROUS : 94.87 %
NICKEL : 94.87 %	ZINC : 94.87 %	IRON : 94.87 %
LEAD : 94.87 %	VANADIUM : 94.87 %	ALUMINUM : 94.87 %
COPPER : 94.87 %	CADMIUM : 94.87 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	2	5.13
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	4	10.26
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (W) # OF EFF	3	7.69

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	59	6.84
EXCEED GROSS LIMIT (G)	6	0.70
OUTLIER DIXON RATIO (D)	4	0.46
EXCEED (G) AND (D)	4	0.46
UNAFFECTED SAMPLES (NO RESULT CODE)	789	91.53

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 1091 *Shallow Lake*
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 27
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 10

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	7	17.9
LEAVES(B)	1	2.6
PARTICULATES(C)	21	53.8
FIBRES(D)	16	41.0
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	8	20.5
SPILL/LEAK(G OR H)	1	2.6
EVENTS MISSED(I)	2	5.1
WET SIDE OPEN(J)	1	2.6
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	1	2.6
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	8	20.5
UNAFFECTED (NO F,I,J,K,L,M,X,E)	31	79.5

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	39	100.0
SAMPLES WITH GDEP AND VOL	39	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 68.6 %
STANDARD DEVIATION IS 20.5
N IS 36.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 75.0 %
STANDARD DEVIATION IS 17.0 WITH N = 19
WINTER (NOV - APR) : 61.5 %
STANDARD DEVIATION IS 22.2 WITH N = 17

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 23.1 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 23.1 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 79.5 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 921.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 98.40 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 77.35 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 99.80 %
 WINTER (NOV - APR) : 96.76 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 97.44 %	PH LAB : 100.00 %
TOTAL H+ : 94.87 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 100.00 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 97.44 %
MAGNESIUM : 100.00 %	POTASSIUM : 100.00 %	SODIUM : 100.00 %
MANGANESE : 97.44 %	AMMONIUM : 97.44 %	PHOSPHOROUS : 97.44 %
NICKEL : 97.44 %	ZINC : 97.44 %	IRON : 97.44 %
LEAD : 97.44 %	VANADIUM : 97.44 %	ALUMINUM : 97.44 %
COPPER : 97.44 %	CADMIUM : 97.44 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	2	5.13
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	1	2.56
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	2	5.13
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	8	20.51

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	8	0.91
EXCEED GROSS LIMIT (G)	6	0.68
OUTLIER DIXON RATIO (D)	0	0.00
EXCEED (G) AND (D)	1	0.11
UNAFFECTED SAMPLES (NO RESULT CODE)	867	98.30

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 1101 Palmerston
PERIOD OF REPORT : 5 JAN 1982 TO 31 DEC 1984

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 23
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 7

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	8	20.5
LEAVES(B)	1	2.6
PARTICULATES(C)	19	48.7
FIBRES(D)	13	33.3
NOT SUBMITTED(E OR X)	1	2.6
MALFUNCTION(F)	3	7.7
SPILL/LEAK(G OR H)	1	2.6
EVENTS MISSED(I)	1	2.6
WET SIDE OPEN(J)	1	2.6
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	1	2.6
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	4	10.3
UNAFFECTED (NO F,I,J,K,L,M,X,E)	35	89.7

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	38	97.4
SAMPLES WITH GDEP AND VOL	38	97.4

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 71.8 %
STANDARD DEVIATION IS 19.3
N IS 37.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 76.4 %
STANDARD DEVIATION IS 14.0 WITH N = 21
WINTER (NOV - APR) : 65.6 %
STANDARD DEVIATION IS 23.7 WITH N = 16

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 7.9 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 21.1 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 78.9 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 848.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 90.60 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 76.82 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 94.84 %
 WINTER (NOV - APR) : 85.65 %

PARAMETER DATA RECOVERY

VOLUME : 97.44 %	CONDUCT : 89.74 %	PH LAB : 94.87 %
TOTAL H+ : 87.18 %	SULPHATE : 94.87 %	NITRATE : 94.87 %
CALCIUM : 92.31 %	CHLORIDE : 94.87 %	KJELDAHL AS N : 89.74 %
MAGNESIUM : 92.31 %	POTASSIUM : 92.31 %	SODIUM : 92.31 %
MANGANESE : 92.31 %	AMMONIUM : 89.74 %	PHOSPHOROUS : 87.18 %
NICKEL : 87.18 %	ZINC : 87.18 %	IRON : 87.18 %
LEAD : 87.18 %	VANADIUM : 87.18 %	ALUMINUM : 87.18 %
COPPER : 87.18 %	CADMIUM : 87.18 %	FREE H+ : 94.87 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	1	2.56
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	1	2.56
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	3	8.11
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	4	10.53

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	38	4.69
EXCEED GROSS LIMIT (G)	11	1.36
OUTLIER DIXON RATIO (D)	9	1.11
EXCEED (G) AND (D)	2	0.25
UNAFFECTED SAMPLES (NO RESULT CODE)	750	92.59

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 1191 Huron Park
PERIOD OF REPORT : 2 FEB 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 38.
SAMPLES WITH FIELD COMMENTS : 27
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 9

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	8	21.1
LEAVES(B)	1	2.6
PARTICULATES(C)	22	57.9
FIBRES(D)	17	44.7
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	1	2.6
SPILL/LEAK(G OR H)	4	10.5
EVENTS MISSED(I)	1	2.6
WET SIDE OPEN(J)	1	2.6
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	2	5.3
UNAFFECTED (NO F,I,J,K,L,M,X,E)	36	94.7

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	38	100.0
SAMPLES WITH VOLUME REPORTED	37	97.4
SAMPLES WITH GDEP AND VOL	37	97.4

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 67.8 %
STANDARD DEVIATION IS 16.1
N IS 33.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 69.6 %
STANDARD DEVIATION IS 11.9 WITH N = 18
WINTER (NOV - APR) : 65.6 %
STANDARD DEVIATION IS 20.2 WITH N = 15

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 13.5 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 21.6 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 78.4 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 38.
 TOTAL # ANALYTICAL RESULTS : 826.
 TOTAL POSSIBLE # RESULTS : 912.
 PERCENT OF DATA RECOVERY : 90.57 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 80.04 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 91.67 %
 WINTER (NOV - APR) : 89.22 %

PARAMETER DATA RECOVERY

VOLUME : 97.37 %	CONDUCT : 92.11 %	PH LAB : 97.37 %
TOTAL H+ : 89.47 %	SULPHATE : 94.74 %	NITRATE : 94.74 %
CALCIUM : 94.74 %	CHLORIDE : 94.74 %	KJELDAHL AS N : 92.11 %
MAGNESIUM : 94.74 %	POTASSIUM : 94.74 %	SODIUM : 94.74 %
MANGANESE : 94.74 %	AMMONIUM : 92.11 %	PHOSPHOROUS : 84.21 %
NICKEL : 84.21 %	ZINC : 84.21 %	IRON : 84.21 %
LEAD : 84.21 %	VANADIUM : 84.21 %	ALUMINUM : 84.21 %
COPPER : 84.21 %	CADMIUM : 84.21 %	FREE H+ : 97.37 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	3	7.89
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	2	5.41
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	5	13.51

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	50	6.34
EXCEED GROSS LIMIT (G)	11	1.39
OUTLIER DIXON RATIO (D)	3	0.38
EXCEED (G) AND (D)	1	0.13
UNAFFECTED SAMPLES (NO RESULT CODE)	724	91.76

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 2021 *Waterloo*
PERIOD OF REPORT : 5 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 26
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 7

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	9	23.1
LEAVES(B)	3	7.7
PARTICULATES(C)	19	48.7
FIBRES(D)	14	35.9
NOT SUBMITTED(E OR X)	2	5.1
MALFUNCTION(F)	4	10.3
SPILL/LEAK(G OR H)	3	7.7
EVENTS MISSED(I)	1	2.6
WET SIDE OPEN(J)	2	5.1
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	6	15.4
UNAFFECTED (NO F,I,J,K,L,M,X,E)	33	84.6

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	37	94.9
SAMPLES WITH GDEP AND VOL	37	94.9

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 71.9 %
STANDARD DEVIATION IS 16.7
N IS 35.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 72.9 %
STANDARD DEVIATION IS 16.2 WITH N = 20
WINTER (NOV - APR) : 70.4 %
STANDARD DEVIATION IS 17.7 WITH N = 15

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 13.5 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 13.5 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 86.5 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 855.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 91.35 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 79.17 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 96.23 %
 WINTER (NOV - APR) : 85.65 %

PARAMETER DATA RECOVERY

VOLUME : 94.87 %	CONDUCT : 89.74 %	PH LAB : 94.87 %
TOTAL H+ : 89.74 %	SULPHATE : 92.31 %	NITRATE : 92.31 %
CALCIUM : 92.31 %	CHLORIDE : 92.31 %	KJELDAHL AS N : 92.31 %
MAGNESIUM : 92.31 %	POTASSIUM : 92.31 %	SODIUM : 92.31 %
MANGANESE : 89.74 %	AMMONIUM : 92.31 %	PHOSPHOROUS : 89.74 %
NICKEL : 89.74 %	ZINC : 89.74 %	IRON : 89.74 %
LEAD : 89.74 %	VANADIUM : 89.74 %	ALUMINUM : 89.74 %
COPPER : 89.74 %	CADMIUM : 89.74 %	FREE H+ : 94.87 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	1	2.56
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	2	5.13
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	3	8.11
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	4	10.81

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	33	4.03
EXCEED GROSS LIMIT (G)	3	0.37
OUTLIER DIXON RATIO (D)	2	0.24
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	780	95.35

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 3011 Dorset
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 16
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 4

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	5	12.8
LEAVES(B)	2	5.1
PARTICULATES(C)	5	12.8
FIBRES(D)	0	0.0
NOT SUBMITTED(E OR I)	0	0.0
MAFUNCTION(F)	3	7.7
SPILL/LEAK(G OR H)	1	2.6
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	1	2.6
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	1	2.6
AFFECTED (F,I,J,K,L,M,X,E)	4	10.3
UNAFFECTED (NO F,I,J,K,L,M,X,E)	35	89.7

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	39	100.0
SAMPLES WITH GDEP AND VOL	39	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 88.2 %
STANDARD DEVIATION IS 8.3
N IS 38.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 91.1 %
STANDARD DEVIATION IS 7.3 WITH N = 21
WINTER (NOV - APR) : 84.6 %
STANDARD DEVIATION IS 8.3 WITH N = 17

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 12.8 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 0.0 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 100.0 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 927.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 99.04 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 87.82 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 100.00 %
 WINTER (NOV - APR) : 97.92 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 100.00 %	PH LAB : 100.00 %
TOTAL H+ : 100.00 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 100.00 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 100.00 %
MAGNESIUM : 100.00 %	POTASSIUM : 100.00 %	SODIUM : 100.00 %
MANGANESE : 100.00 %	AMMONIUM : 100.00 %	PHOSPHOROUS : 97.44 %
NICKEL : 97.44 %	ZINC : 97.44 %	IRON : 97.44 %
LEAD : 97.44 %	VANADIUM : 97.44 %	ALUMINUM : 97.44 %
COPPER : 97.44 %	CADMIUM : 97.44 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	2	5.13
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	2	5.13
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	0	0.00

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	3	0.34
EXCEED GROSS LIMIT (G)	1	0.11
OUTLIER DIXON RATIO (D)	5	0.56
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	879	98.99

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 3051 Milton
PERIOD OF REPORT : 5 JAN 1982 TO 27 MAR 1984

TOTAL # OF SAMPLES COLLECTED : 29.
SAMPLES WITH FIELD COMMENTS : 21
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 13

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	4	13.8
LEAVES(B)	0	0.0
PARTICULATES(C)	4	13.8
FIBRES(D)	1	3.4
NOT SUBMITTED(E OR X)	1	3.4
MALFUNCTION(F)	9	31.0
SPILL/LEAK(G OR H)	8	27.6
EVENTS MISSED(I)	1	3.4
WET SIDE OPEN(J)	4	13.8
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	1	3.4
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	11	37.9
UNAFFECTED (NO F,I,J,K,L,M,X,E)	18	62.1

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	29	100.0
SAMPLES WITH VOLUME REPORTED	27	93.1
SAMPLES WITH GDEP AND VOL	27	93.1

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 57.7 %
STANDARD DEVIATION IS 21.0
N IS 20.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 58.2 %
STANDARD DEVIATION IS 19.6 WITH N = 12
WINTER (NOV - APR) : 57.0 %
STANDARD DEVIATION IS 24.4 WITH N = 8

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 48.1 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 25.9 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 74.1 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 29.
 TOTAL # ANALYTICAL RESULTS : 603.
 TOTAL POSSIBLE # RESULTS : 696.
 PERCENT OF DATA RECOVERY : 86.64 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 51.44 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 100.00 %
 WINTER (NOV - APR) : 74.17 %

PARAMETER DATA RECOVERY

VOLUME : 93.10 %	CONDUCT : 86.21 %	PH LAB : 86.21 %
TOTAL H+ : 86.21 %	SULPHATE : 89.66 %	NITRATE : 89.66 %
CALCIUM : 89.66 %	CHLORIDE : 89.66 %	KJELDAHL AS N : 89.66 %
MAGNESIUM : 89.66 %	POTASSIUM : 89.66 %	SODIUM : 89.66 %
MANGANESE : 89.66 %	AMMONIUM : 89.66 %	PHOSPHOROUS : 82.76 %
NICKEL : 82.76 %	ZINC : 82.76 %	IRON : 82.76 %
LEAD : 82.76 %	VANADIUM : 82.76 %	ALUMINUM : 82.76 %
COPPER : 82.76 %	CADMIUM : 82.76 %	FREE H+ : 86.21 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	2	6.90
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	4	13.79
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	8	32.00
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	5	18.52

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	84	14.58
EXCEED GROSS LIMIT (G)	6	1.04
OUTLIER DIXON RATIO (D)	4	0.69
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	482	83.68

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 3061 Uxbridge
PERIOD OF REPORT : 4 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 17
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 12

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	3	7.7
LEAVES(B)	0	0.0
PARTICULATES(C)	7	17.9
FIBRES(D)	2	5.1
NOT SUBMITTED(E OR I)	1	2.6
MALFUNCTION(F)	3	7.7
SPILL/LEAK(G OR H)	4	10.3
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	3	7.7
NO PRECIP. COLLECTED(K)	1	2.6
DRY SIDE OPEN(M)	1	2.6
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	5	12.8
UNAFFECTED (NO F,I,J,K,L,M,X,E)	34	87.2

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	37	94.9
SAMPLES WITH GDEP AND VOL	37	94.9

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 68.2 %
STANDARD DEVIATION IS 17.9
N IS 34.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 71.9 %
STANDARD DEVIATION IS 15.4 WITH N = 19
WINTER (NOV - APR) : 63.5 %
STANDARD DEVIATION IS 20.2 WITH N = 15

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 18.9 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 24.3 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 78.4 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 866.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 92.52 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 78.10 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 95.24 %
 WINTER (NOV - APR) : 89.35 %

PARAMETER DATA RECOVERY

VOLUME : 94.87 %	CONDUCT : 94.87 %	PH LAB : 94.87 %
TOTAL H+ : 94.87 %	SULPHATE : 94.87 %	NITRATE : 94.87 %
CALCIUM : 92.31 %	CHLORIDE : 94.87 %	KJELDAHL AS N : 94.87 %
MAGNESIUM : 92.31 %	POTASSIUM : 92.31 %	SODIUM : 92.31 %
MANGANESE : 94.87 %	AMMONIUM : 94.87 %	PHOSPHOROUS : 89.74 %
NICKEL : 89.74 %	ZINC : 89.74 %	IRON : 89.74 %
LEAD : 89.74 %	VANADIUM : 89.74 %	ALUMINUM : 89.74 %
COPPER : 89.74 %	CADMIUM : 89.74 %	FREE H+ : 94.87 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	3	7.69
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	3	7.69
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	4	10.81
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	8	21.62

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	42	5.07
EXCEED GROSS LIMIT (G)	8	0.97
OUTLIER DIXON RATIO (D)	7	0.84
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	772	93.12

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 3071 Wilberforce
PERIOD OF REPORT : 31 DEC 1981 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 38.
SAMPLES WITH FIELD COMMENTS : 14
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 5

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	4	10.5
LEAVES(B)	0	0.0
PARTICULATES(C)	6	15.8
FIBRES(D)	0	0.0
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	3	7.9
SPILL/LEAK(G OR H)	5	13.2
EVENTS MISSED(I)	1	2.6
WET SIDE OPEN(J)	2	5.3
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	3	7.9
AFFECTED (F,I,J,K,L,M,X,E)	3	7.9
UNAFFECTED (NO F,I,J,K,L,M,X,E)	35	92.1

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	38	100.0
SAMPLES WITH VOLUME REPORTED	38	100.0
SAMPLES WITH GDEP AND VOL	38	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 79.1 %
STANDARD DEVIATION IS 13.5
N IS 33.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 81.7 %
STANDARD DEVIATION IS 8.7 WITH N = 18
WINTER (NOV - APR) : 76.0 %
STANDARD DEVIATION IS 17.4 WITH N = 15

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 21.1 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 2.6 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 97.4 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 38.
 TOTAL # ANALYTICAL RESULTS : 910.
 TOTAL POSSIBLE # RESULTS : 912.
 PERCENT OF DATA RECOVERY : 99.78 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 90.79 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 100.00 %
 WINTER (NOV - APR) : 99.51 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 100.00 %	PH LAB : 100.00 %
TOTAL H+ : 97.37 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 100.00 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 100.00 %
MAGNESIUM : 100.00 %	POTASSIUM : 100.00 %	SODIUM : 100.00 %
MANGANESE : 100.00 %	AMMONIUM : 100.00 %	PHOSPHOROUS : 100.00 %
NICKEL : 100.00 %	ZINC : 100.00 %	IRON : 100.00 %
LEAD : 97.37 %	VANADIUM : 100.00 %	ALUMINUM : 100.00 %
COPPER : 100.00 %	CADMIUM : 100.00 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	3	7.89
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	4	10.53
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	4	10.53
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	1	2.63

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	4	0.46
EXCEED GROSS LIMIT (G)	5	0.57
OUTLIER DIXON RATIO (D)	0	0.00
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	863	98.97

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 3081 *Campellford*
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39,
SAMPLES WITH FIELD COMMENTS : 22
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 14

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	10	25.6
LEAVES(B)	2	5.1
PARTICULATES(C)	6	15.4
FIBRES(D)	7	17.9
NOT SUBMITTED(E OR X)	2	5.1
MALFUNCTION(F)	6	15.4
SPILL/LEAK(G OR H)	4	10.3
EVENTS MISSED(I)	1	2.6
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	7	17.9
UNAFFECTED (NO F,I,J,K,L,M,X,E)	32	82.1

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	37	94.9
SAMPLES WITH GDEP AND VOL	37	94.9

AVERAGE SAMPLING EFFICIENCY (< 120; NO 6, H CODES) 61.3 %
STANDARD DEVIATION IS 21.9
N IS 33.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 61.9 %
STANDARD DEVIATION IS 18.8 WITH N = 18
WINTER (NOV - APR) : 60.7 %
STANDARD DEVIATION IS 25.8 WITH N = 15

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 21.6 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 27.0 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 75.7 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 823.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 87.93 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 71.69 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 95.04 %
 WINTER (NOV - APR) : 79.63 %

PARAMETER DATA RECOVERY

VOLUME : 94.87 %	CONDUCT : 87.18 %	PH LAB : 92.31 %
TOTAL H+ : 87.18 %	SULPHATE : 92.31 %	NITRATE : 92.31 %
CALCIUM : 92.31 %	CHLORIDE : 92.31 %	KJELDAHL AS N : 89.74 %
MAGNESIUM : 92.31 %	POTASSIUM : 92.31 %	SODIUM : 92.31 %
MANGANESE : 92.31 %	AMMONIUM : 89.74 %	PHOSPHOROUS : 82.05 %
NICKEL : 82.05 %	ZINC : 82.05 %	IRON : 82.05 %
LEAD : 82.05 %	VANADIUM : 82.05 %	ALUMINUM : 82.05 %
COPPER : 82.05 %	CADMIUM : 82.05 %	FREE H+ : 92.31 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	2	5.13
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	4	11.11
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	8	21.62

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	24	3.05
EXCEED GROSS LIMIT (G)	4	0.51
OUTLIER DIXON RATIO (D)	7	0.89
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	751	95.55

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 3101 Coldwater
PERIOD OF REPORT : 5 JAN 1982 TO 31 DEC 1984

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 26
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 12

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	15	38.5
LEAVES(B)	0	0.0
PARTICULATES(C)	6	15.4
FIBRES(D)	0	0.0
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	6	15.4
SPILL/LEAK(G OR H)	5	12.8
EVENTS MISSED(I)	6	15.4
WET SIDE OPEN(J)	1	2.6
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	2	5.1
AFFECTED (F,I,J,K,L,M,X,E)	8	20.5
UNAFFECTED (NO F,I,J,K,L,M,X,E)	31	79.5

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	39	100.0
SAMPLES WITH BDEP AND VOL	39	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 81.1 %
STANDARD DEVIATION IS 20.1
N IS 31.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 85.4 %
STANDARD DEVIATION IS 19.1 WITH N = 19
WINTER (NOV - APR) : 74.1 %
STANDARD DEVIATION IS 20.5 WITH N = 12

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 33.3 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 17.9 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 82.1 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 917.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 97.97 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 74.79 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 98.21 %
 WINTER (NOV - APR) : 97.69 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 100.00 %	PH LAB : 100.00 %
TOTAL H+ : 97.44 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 100.00 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 100.00 %
MAGNESIUM : 100.00 %	POTASSIUM : 100.00 %	SODIUM : 100.00 %
MANGANESE : 100.00 %	AMMONIUM : 100.00 %	PHOSPHOROUS : 94.87 %
NICKEL : 94.87 %	ZINC : 94.87 %	IRON : 94.87 %
LEAD : 94.87 %	VANADIUM : 94.87 %	ALUMINUM : 94.87 %
COPPER : 94.87 %	CADMIUM : 94.87 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	1	2.56
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	3	7.69
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	5	12.82
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	6	15.38

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	23	2.62
EXCEED GROSS LIMIT (G)	6	0.68
OUTLIER DIXON RATIO (D)	6	0.68
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	843	96.01

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 4051 Kaladar
PERIOD OF REPORT : 5 JAN 1982 TO 9 NOV 1982

TOTAL # OF SAMPLES COLLECTED : 11.
SAMPLES WITH FIELD COMMENTS : 6
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 3

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	3	27.3
LEAVES(B)	0	0.0
PARTICULATES(C)	0	0.0
FIBRES(D)	1	9.1
NOT SUBMITTED(E OR I)	0	0.0
MALFUNCTION(F)	0	0.0
SPILL/LEAK(G OR H)	3	27.3
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	0	0.0
UNAFFECTED (NO F,I,J,K,L,M,X,E)	11	100.0

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	11	100.0
SAMPLES WITH VOLUME REPORTED	11	100.0
SAMPLES WITH GDEP AND VOL	11	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 59.8 %
STANDARD DEVIATION IS 31.9
N IS 7.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 66.5 %
STANDARD DEVIATION IS 27.1 WITH N = 5
WINTER (NOV - APR) : 43.0 %
STANDARD DEVIATION IS 48.8 WITH N = 2

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 27.3 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 27.3 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 72.7 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 11.
 TOTAL # ANALYTICAL RESULTS : 251.
 TOTAL POSSIBLE # RESULTS : 264.
 PERCENT OF DATA RECOVERY : 95.08 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 93.18 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 100.00 %
 WINTER (NOV - APR) : 86.46 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 90.91 %	PH LAB : 100.00 %
TOTAL H+ : 90.91 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 100.00 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 90.91 %
MAGNESIUM : 100.00 %	POTASSIUM : 100.00 %	SODIUM : 100.00 %
MANGANESE : 100.00 %	AMMONIUM : 90.91 %	PHOSPHOROUS : 90.91 %
NICKEL : 90.91 %	ZINC : 90.91 %	IRON : 90.91 %
LEAD : 90.91 %	VANADIUM : 90.91 %	ALUMINUM : 90.91 %
COPPER : 90.91 %	CADMIUM : 90.91 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	0	0.00
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	0	0.00
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	3	27.27

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	3	1.25
EXCEED GROSS LIMIT (G)	0	0.00
OUTLIER DIXON RATIO (D)	0	0.00
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	237	98.75

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 4061 Smith Falls
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 20
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 14

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	13	33.3
LEAVES(B)	1	2.6
PARTICULATES(C)	4	10.3
FIBRES(D)	7	17.9
NOT SUBMITTED(E OR I)	0	0.0
MALFUNCTION(F)	2	5.1
SPILL/LEAK(G OR H)	5	12.8
EVENTS MISSED(I)	1	2.6
WET SIDE OPEN(J)	1	2.6
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	1	2.6
AFFECTED (F,I,J,K,L,M,X,E)	3	7.7
UNAFFECTED (NO F,I,J,K,L,M,X,E)	36	92.3

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	38	97.4
SAMPLES WITH GDEP AND VOL	38	97.4

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 66.6 %
STANDARD DEVIATION IS 23.0
N IS 31.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 73.6 %
STANDARD DEVIATION IS 19.4 WITH N = 17
WINTER (NOV - APR) : 58.0 %
STANDARD DEVIATION IS 24.7 WITH N = 14

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 18.4 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 31.6 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 76.3 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 838.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 89.53 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 75.32 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 92.86 %
 WINTER (NOV - APR) : 85.65 %

PARAMETER DATA RECOVERY

VOLUME : 97.44 %	CONDUCT : 84.62 %	PH LAB : 92.31 %
TOTAL H+ : 84.62 %	SULPHATE : 94.87 %	NITRATE : 94.87 %
CALCIUM : 94.87 %	CHLORIDE : 94.87 %	KJELDAHL AS N : 89.74 %
MAGNESIUM : 94.87 %	POTASSIUM : 94.87 %	SODIUM : 94.87 %
MANGANESE : 92.31 %	AMMONIUM : 89.74 %	PHOSPHOROUS : 84.62 %
NICKEL : 84.62 %	ZINC : 84.62 %	IRON : 84.62 %
LEAD : 84.62 %	VANADIUM : 84.62 %	ALUMINUM : 84.62 %
COPPER : 84.62 %	CADMIUM : 84.62 %	FREE H+ : 92.31 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	1	2.56
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	2	5.13
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	6	16.67
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	11	28.95

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	56	7.00
EXCEED GROSS LIMIT (G)	8	1.00
OUTLIER DIXON RATIO (D)	18	2.25
EXCEED (G) AND (D)	9	1.13
UNAFFECTED SAMPLES (NO RESULT CODE)	709	88.63

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 4071 Dalhousie Mills
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 30
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 14

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	16	41.0
LEAVES(B)	2	5.1
PARTICULATES(C)	6	15.4
FIBRES(D)	10	25.6
NOT SUBMITTED(E OR I)	0	0.0
MALFUNCTION(F)	6	15.4
SPILL/LEAK(G OR H)	7	17.9
EVENTS MISSED(I)	4	10.3
WET SIDE OPEN(J)	1	2.6
NO PRECIP. COLLECTED(K)	1	2.6
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	2	5.1
AFFECTED (F,I,J,K,L,M,X,E)	7	17.9
UNAFFECTED (NO F,I,J,K,L,M,X,E)	32	82.1

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	39	100.0
SAMPLES WITH GDEP AND VOL	39	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 68.3 %
STANDARD DEVIATION IS 23.0
N IS 32.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 73.5 %
STANDARD DEVIATION IS 22.6 WITH N = 18
WINTER (NOV - APR) : 61.5 %
STANDARD DEVIATION IS 22.5 WITH N = 14

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 33.3 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 38.5 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 66.7 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 907.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 96.90 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 70.94 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 98.02 %
 WINTER (NOV - APR) : 95.60 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 97.44 %	PH LAB : 100.00 %
TOTAL H+ : 97.44 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 100.00 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 100.00 %
MAGNESIUM : 100.00 %	POTASSIUM : 100.00 %	SODIUM : 100.00 %
MANGANESE : 100.00 %	AMMONIUM : 100.00 %	PHOSPHOROUS : 92.31 %
NICKEL : 92.31 %	ZINC : 92.31 %	IRON : 92.31 %
LEAD : 92.31 %	VANADIUM : 92.31 %	ALUMINUM : 92.31 %
COPPER : 92.31 %	CADMIUM : 92.31 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	1	2.56
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	4	10.26
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	11	28.21

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	38	4.38
EXCEED GROSS LIMIT (G)	20	2.30
OUTLIER DIXON RATIO (D)	33	3.80
EXCEED (G) AND (D)	7	0.81
UNAFFECTED SAMPLES (NO RESULT CODE)	770	88.71

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 4081 Golden Lake
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 18
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 10

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	8	20.5
LEAVES(B)	1	2.6
PARTICULATES(C)	4	10.3
FIBRES(D)	7	17.9
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	2	5.1
SPILL/LEAK(G OR H)	4	10.3
EVENTS MISSED(I)	2	5.1
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	3	7.7
UNAFFECTED (NO F,I,J,K,L,M,X,E)	36	92.3

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	39	100.0
SAMPLES WITH GDEP AND VOL	39	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO 6, H CODES) 77.6 %
STANDARD DEVIATION IS 17.1
N IS 35.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 74.3 %
STANDARD DEVIATION IS 19.0 WITH N = 20
WINTER (NOV - APR) : 82.1 %
STANDARD DEVIATION IS 13.7 WITH N = 15

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,6,H,I,J,K,M,L OR P) : 17.9 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 7.7 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 94.9 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 924.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 98.72 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 89.21 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 99.80 %
 WINTER (NOV - APR) : 97.45 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 97.44 %	PH LAB : 100.00 %
TOTAL H+ : 97.44 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 97.44 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 100.00 %
MAGNESIUM : 100.00 %	POTASSIUM : 100.00 %	SODIUM : 100.00 %
MANGANESE : 100.00 %	AMMONIUM : 100.00 %	PHOSPHOROUS : 97.44 %
NICKEL : 97.44 %	ZINC : 97.44 %	IRON : 97.44 %
LEAD : 97.44 %	VANADIUM : 97.44 %	ALUMINUM : 97.44 %
COPPER : 97.44 %	CADMIUM : 97.44 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	2	5.13
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	5	12.82
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	5	12.82
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	3	7.69

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	15	1.69
EXCEED GROSS LIMIT (G)	6	0.68
OUTLIER DIXON RATIO (D)	1	0.11
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	863	97.51

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 4091 Cloyne
PERIOD OF REPORT : 4 DEC 1984 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 1.
SAMPLES WITH FIELD COMMENTS : 0
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	0	0.0
LEAVES(B)	0	0.0
PARTICULATES(C)	0	0.0
FIBRES(D)	0	0.0
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	0	0.0
SPILL/LEAK(G OR H)	0	0.0
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	0	0.0
UNAFFECTED (NO F,I,J,K,L,M,X,E)	1	100.0

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	0	0.0
SAMPLES WITH VOLUME REPORTED	1	100.0
SAMPLES WITH GDEP AND VOL	0	0.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO E, H CODES) 0.0 %
STANDARD DEVIATION IS 0.0
N IS 0.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 0.0 %
STANDARD DEVIATION IS 0.0 WITH N = 0
WINTER (NOV - APR) : 0.0 %
STANDARD DEVIATION IS 0.0 WITH N = 0

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 0.0 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 0.0 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 0.0 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 1.
 TOTAL # ANALYTICAL RESULTS : 23.
 TOTAL POSSIBLE # RESULTS : 24.
 PERCENT OF DATA RECOVERY : 95.83 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 95.83 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 0.00 %
 WINTER (NOV - APR) : 95.83 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 100.00 %	PH LAB : 100.00 %
TOTAL H+ : 0.00 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 100.00 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 100.00 %
MAGNESIUM : 100.00 %	POTASSIUM : 100.00 %	SODIUM : 100.00 %
MANGANESE : 100.00 %	AMMONIUM : 100.00 %	PHOSPHOROUS : 100.00 %
NICKEL : 100.00 %	ZINC : 100.00 %	IRON : 100.00 %
LEAD : 100.00 %	VANADIUM : 100.00 %	ALUMINUM : 100.00 %
COPPER : 100.00 %	CADMIUM : 100.00 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	0	0.00
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	0	0.00
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	0	0.00

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
OUTLIER DIION RATIO (D)	0	0.00
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	22	100.00

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 5011 McKellar
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 30
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 9

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	12	30.8
LEAVES(B)	0	0.0
PARTICULATES(C)	13	33.3
FIBRES(D)	17	43.6
NOT SUBMITTED(E OR I)	1	2.6
MALFUNCTION(F)	4	10.3
SPILL/LEAK(G OR H)	14	35.9
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	1	2.6
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	6	15.4
UNAFFECTED (NO F,I,J,K,L,M,X,E)	33	84.6

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	38	97.4
SAMPLES WITH GDEP AND VOL	38	97.4

AVERAGE SAMPLING EFFICIENCY (< 120; NO 6, H CODES) 71.6 %
STANDARD DEVIATION IS 13.7
N IS 25.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 72.5 %
STANDARD DEVIATION IS 13.2 WITH N = 16
WINTER (NOV - APR) : 70.1 %
STANDARD DEVIATION IS 15.1 WITH N = 9

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 44.7 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 15.8 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 86.8 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 883.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 94.34 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 77.56 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 95.04 %
 WINTER (NOV - APR) : 93.52 %

PARAMETER DATA RECOVERY

VOLUME : 97.44 %	CONDUCT : 89.74 %	PH LAB : 97.44 %
TOTAL H+ : 94.87 %	SULPHATE : 97.44 %	NITRATE : 97.44 %
CALCIUM : 94.87 %	CHLORIDE : 97.44 %	KJELDAHL AS N : 94.87 %
MAGNESIUM : 94.87 %	POTASSIUM : 94.87 %	SODIUM : 94.87 %
MANGANESE : 94.87 %	AMMONIUM : 94.87 %	PHOSPHOROUS : 92.31 %
NICKEL : 92.31 %	ZINC : 92.31 %	IRON : 92.31 %
LEAD : 92.31 %	VANADIUM : 92.31 %	ALUMINUM : 92.31 %
COPPER : 92.31 %	CADMIUM : 92.31 %	FREE H+ : 97.44 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	2	5.13
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	4	10.26
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	2	5.26
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	3	7.89

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	20	2.37
EXCEED GROSS LIMIT (G)	10	1.18
OUTLIER DIXON RATIO (D)	7	0.83
EXCEED (G) AND (D)	3	0.36
UNAFFECTED SAMPLES (NO RESULT CODE)	805	95.27

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 5021 Killarney
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 17
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 8

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	3	7.7
LEAVES(B)	0	0.0
PARTICULATES(C)	10	25.6
FIBRES(D)	9	23.1
NOT SUBMITTED(E OR I)	1	2.6
MALFUNCTION(F)	2	5.1
SPILL/LEAK(G OR H)	8	20.5
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	2	5.1
UNAFFECTED (NO F,I,J,K,L,M,X,E)	37	94.9

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	38	97.4
SAMPLES WITH GDEP AND VOL	38	97.4

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 71.5 %
STANDARD DEVIATION IS 14.6
N IS 29.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 68.7 %
STANDARD DEVIATION IS 15.9 WITH N = 16
WINTER (NOV - APR) : 75.0 %
STANDARD DEVIATION IS 12.5 WITH N = 13

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 23.7 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 18.4 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 86.8 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 879.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 93.91 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 87.71 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 94.44 %
 WINTER (NOV - APR) : 93.29 %

PARAMETER DATA RECOVERY

VOLUME : 97.44 %	CONDUCT : 94.87 %	PH LAB : 97.44 %
TOTAL H+ : 92.31 %	SULPHATE : 97.44 %	NITRATE : 97.44 %
CALCIUM : 92.31 %	CHLORIDE : 97.44 %	KJELDAHL AS N : 92.31 %
MAGNESIUM : 92.31 %	POTASSIUM : 92.31 %	SODIUM : 94.87 %
MANGANESE : 94.87 %	AMMONIUM : 92.31 %	PHOSPHOROUS : 92.31 %
NICKEL : 92.31 %	ZINC : 92.31 %	IRON : 92.31 %
LEAD : 92.31 %	VANADIUM : 92.31 %	ALUMINUM : 92.31 %
COPPER : 92.31 %	CADMIUM : 92.31 %	FREE H+ : 97.44 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	0	0.00
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	0	0.00
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	6	15.79

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	18	2.14
EXCEED GROSS LIMIT (G)	8	0.95
OUTLIER DIXON RATIO (D)	4	0.48
EXCEED (G) AND (D)	2	0.24
UNAFFECTED SAMPLES (NO RESULT CODE)	809	96.19

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 5031 Mattawa
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 25
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 9

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	5	12.8
LEAVES(B)	0	0.0
PARTICULATES(C)	13	33.3
FIBRES(D)	8	20.5
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	2	5.1
SPILL/LEAK(G OR H)	6	15.4
EVENTS MISSED(I)	1	2.6
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	1	2.6
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	3	7.7
UNAFFECTED (NO F,I,J,K,L,M,X,E)	36	92.3

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	39	100.0
SAMPLES WITH GDEP AND VOL	39	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 75.7 %
STANDARD DEVIATION IS 19.4
N IS 33.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 81.0 %
STANDARD DEVIATION IS 12.4 WITH N = 19
WINTER (NOV - APR) : 68.5 %
STANDARD DEVIATION IS 24.8 WITH N = 14

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 23.1 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 20.5 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 82.1 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 885.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 94.55 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 83.97 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 99.01 %
 WINTER (NOV - APR) : 89.35 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 92.31 %	PH LAB : 97.44 %
TOTAL H+ : 92.31 %	SULPHATE : 94.87 %	NITRATE : 94.87 %
CALCIUM : 97.44 %	CHLORIDE : 92.31 %	KJELDAHL AS N : 94.87 %
MAGNESIUM : 97.44 %	POTASSIUM : 97.44 %	SODIUM : 97.44 %
MANGANESE : 97.44 %	AMMONIUM : 94.87 %	PHOSPHOROUS : 92.31 %
NICKEL : 92.31 %	ZINC : 92.31 %	IRON : 92.31 %
LEAD : 92.31 %	VANADIUM : 92.31 %	ALUMINUM : 92.31 %
COPPER : 92.31 %	CADMIUM : 92.31 %	FREE H+ : 97.44 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	2	5.13
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	1	2.56
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	0	0.00
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	7	17.95

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	31	3.66
EXCEED GROSS LIMIT (G)	6	0.71
OUTLIER DIXON RATIO (D)	4	0.47
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	805	95.15

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 5041 Bear Island
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 38.
SAMPLES WITH FIELD COMMENTS : 24
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 10

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	11	28.9
LEAVES(B)	8	21.1
PARTICULATES(C)	13	34.2
FIBRES(D)	11	28.9
NOT SUBMITTED(E OR X)	2	5.3
MALFUNCTION(F)	2	5.3
SPILL/LEAK(G OR H)	7	18.4
EVENTS MISSED(I)	1	2.6
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	4	10.5
UNAFFECTED (NO F,I,J,K,L,M,X,E)	34	89.5

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	35	92.1
SAMPLES WITH VOLUME REPORTED	36	94.7
SAMPLES WITH GDEP AND VOL	33	86.8

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 86.0 %
STANDARD DEVIATION IS 14.1
N IS 21.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 89.8 %
STANDARD DEVIATION IS 14.1 WITH N = 13
WINTER (NOV - APR) : 79.7 %
STANDARD DEVIATION IS 12.4 WITH N = 8

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 24.2 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 21.2 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 78.8 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 38.
 TOTAL # ANALYTICAL RESULTS : 844.
 TOTAL POSSIBLE # RESULTS : 912.
 PERCENT OF DATA RECOVERY : 92.54 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 84.76 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 99.60 %
 WINTER (NOV - APR) : 83.82 %

PARAMETER DATA RECOVERY

VOLUME : 94.74 %	CONDUCT : 92.11 %	PH LAB : 94.74 %
TOTAL H+ : 89.47 %	SULPHATE : 94.74 %	NITRATE : 94.74 %
CALCIUM : 94.74 %	CHLORIDE : 94.74 %	KJELDAHL AS N : 84.21 %
MAGNESIUM : 94.74 %	POTASSIUM : 94.74 %	SODIUM : 94.74 %
MANGANESE : 94.74 %	AMMONIUM : 84.21 %	PHOSPHOROUS : 92.11 %
NICKEL : 92.11 %	ZINC : 92.11 %	IRON : 92.11 %
LEAD : 92.11 %	VANADIUM : 92.11 %	ALUMINUM : 92.11 %
COPPER : 92.11 %	CADMIUM : 92.11 %	FREE H+ : 94.74 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	3	7.89
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	4	10.53
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	2	5.56
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	7	21.21

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	17	2.10
EXCEED GROSS LIMIT (G)	9	1.11
OUTLIER DIXON RATIO (D)	6	0.74
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	776	96.04

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 5051 Ramsey
PERIOD OF REPORT : 6 JAN 1982 TO 24 JUL 1983

TOTAL # OF SAMPLES COLLECTED : 20.
SAMPLES WITH FIELD COMMENTS : 11
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 3

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	7	35.0
LEAVES(B)	0	0.0
PARTICULATES(C)	4	20.0
FIBRES(D)	5	25.0
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	1	5.0
SPILL/LEAK(G OR H)	2	10.0
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	1	5.0
UNAFFECTED (NO F,I,J,K,L,M,X,E)	19	95.0

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	20	100.0
SAMPLES WITH VOLUME REPORTED	20	100.0
SAMPLES WITH GDEP AND VOL	20	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 84.7 %
STANDARD DEVIATION IS 14.1
N IS 17.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 84.8 %
STANDARD DEVIATION IS 15.9 WITH N = 9
WINTER (NOV - APR) : 84.6 %
STANDARD DEVIATION IS 12.7 WITH N = 8

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 10.0 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 15.0 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 85.0 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 20.
 TOTAL # ANALYTICAL RESULTS : 467.
 TOTAL POSSIBLE # RESULTS : 480.
 PERCENT OF DATA RECOVERY : 97.29 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 90.63 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 100.00 %
 WINTER (NOV - APR) : 94.58 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 95.00 %	PH LAB : 100.00 %
TOTAL H+ : 100.00 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 100.00 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 95.00 %
MAGNESIUM : 100.00 %	POTASSIUM : 100.00 %	SODIUM : 100.00 %
MANGANESE : 95.00 %	AMMONIUM : 95.00 %	PHOSPHOROUS : 95.00 %
NICKEL : 95.00 %	ZINC : 95.00 %	IRON : 95.00 %
LEAD : 95.00 %	VANADIUM : 95.00 %	ALUMINUM : 95.00 %
COPPER : 95.00 %	CADMIUM : 95.00 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	0	0.00
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	0	0.00
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	3	15.00

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	7	1.57
EXCEED GROSS LIMIT (G)	0	0.00
OUTLIER DIXON RATIO (D)	1	0.22
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	439	98.21

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 5061 Gowganda
PERIOD OF REPORT : 8 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 38.
SAMPLES WITH FIELD COMMENTS : 28
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 13

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	6	15.8
LEAVES(B)	1	2.6
PARTICULATES(C)	6	15.8
FIBRES(D)	12	31.6
NOT SUBMITTED(E OR X)	4	10.5
MALFUNCTION(F)	4	10.5
SPILL/LEAK(G OR H)	18	47.4
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	7	18.4
UNAFFECTED (NO F,I,J,K,L,M,X,E)	31	81.6

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	37	97.4
SAMPLES WITH VOLUME REPORTED	33	86.8
SAMPLES WITH GDEP AND VOL	32	84.2

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 67.9 %
STANDARD DEVIATION IS 29.8
N IS 15.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 81.6 %
STANDARD DEVIATION IS 20.2 WITH N = 6
WINTER (NOV - APR) : 58.8 %
STANDARD DEVIATION IS 32.7 WITH N = 9

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 53.1 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 28.1 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 71.9 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 38.
 TOTAL # ANALYTICAL RESULTS : 718.
 TOTAL POSSIBLE # RESULTS : 912.
 PERCENT OF DATA RECOVERY : 78.73 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 72.48 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 79.37 %
 WINTER (NOV - APR) : 77.94 %

PARAMETER DATA RECOVERY

VOLUME : 86.84 %	CONDUCT : 81.58 %	PH LAB : 84.21 %
TOTAL H+ : 81.58 %	SULPHATE : 84.21 %	NITRATE : 84.21 %
CALCIUM : 78.95 %	CHLORIDE : 84.21 %	KJELDAHL AS N : 78.95 %
MAGNESIUM : 78.95 %	POTASSIUM : 78.95 %	SODIUM : 78.95 %
MANGANESE : 81.58 %	AMMONIUM : 78.95 %	PHOSPHOROUS : 73.68 %
NICKEL : 73.68 %	ZINC : 73.68 %	IRON : 73.68 %
LEAD : 73.68 %	VANADIUM : 73.68 %	ALUMINUM : 73.68 %
COPPER : 73.68 %	CADMIUM : 73.68 %	FREE H+ : 84.21 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	4	10.53
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	4	10.53
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	4	12.50
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	5	15.63

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	16	2.34
EXCEED GROSS LIMIT (G)	8	1.17
OUTLIER DIXON RATIO (D)	7	1.02
EXCEED (G) AND (D)	3	0.44
UNAFFECTED SAMPLES (NO RESULT CODE)	651	95.04

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 5071 Moonbeam
PERIOD OF REPORT : 5 JAN 1982 TO 3 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 21
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 12

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	7	17.9
LEAVES(B)	0	0.0
PARTICULATES(C)	10	25.6
FIBRES(D)	8	20.5
NOT SUBMITTED(E OR X)	1	2.6
MALFUNCTION(F)	1	2.6
SPILL/LEAK(G OR H)	7	17.9
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	1	2.6
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	3	7.7
UNAFFECTED (NO F,I,J,K,L,M,X,E)	36	92.3

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	38	97.4
SAMPLES WITH GDEF AND VOL	38	97.4

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 64.5 %
STANDARD DEVIATION IS 23.3
N IS 31.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 74.4 %
STANDARD DEVIATION IS 16.0 WITH N = 18
WINTER (NOV - APR) : 50.8 %
STANDARD DEVIATION IS 25.3 WITH N = 13

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 18.4 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 31.6 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 71.1 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 824.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 88.03 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 79.38 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 96.83 %
 WINTER (NOV - APR) : 77.78 %

PARAMETER DATA RECOVERY

VOLUME : 97.44 %	CONDUCT : 89.74 %	PH LAB : 94.87 %
TOTAL H+ : 89.74 %	SULPHATE : 94.87 %	NITRATE : 94.87 %
CALCIUM : 84.62 %	CHLORIDE : 94.87 %	KJELDAHL AS N : 87.18 %
MAGNESIUM : 84.62 %	POTASSIUM : 84.62 %	SODIUM : 84.62 %
MANGANESE : 87.18 %	AMMONIUM : 87.18 %	PHOSPHOROUS : 84.62 %
NICKEL : 84.62 %	ZINC : 84.62 %	IRON : 84.62 %
LEAD : 84.62 %	VANADIUM : 84.62 %	ALUMINUM : 84.62 %
COPPER : 84.62 %	CADMIUM : 84.62 %	FREE H+ : 94.87 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	0	0.00
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	2	5.41
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	10	26.32

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	22	2.80
EXCEED GROSS LIMIT (G)	12	1.53
OUTLIER DIXON RATIO (D)	3	0.38
EXCEED (G) AND (D)	1	0.13
UNAFFECTED SAMPLES (NO RESULT CODE)	748	95.17

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 5081 Attawapiskat
PERIOD OF REPORT : 9 JAN 1982 TO 28 FEB 1984

TOTAL # OF SAMPLES COLLECTED : 21.
SAMPLES WITH FIELD COMMENTS : 14
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 14

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	4	19.0
LEAVES(B)	1	4.8
PARTICULATES(C)	3	14.3
FIBRES(D)	4	19.0
NOT SUBMITTED(E OR I)	4	19.0
FAILURE(F)	1	4.8
SPILL/LEAK(G OR H)	4	19.0
EVENTS MISSED(I)	1	4.8
WET SIDE OPEN(J)	1	4.8
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	2	9.5
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	6	28.6
UNAFFECTED (NO F,I,J,K,L,M,X,E)	15	71.4

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	8	38.1
SAMPLES WITH VOLUME REPORTED	19	90.5
SAMPLES WITH GDEP AND VOL	7	33.3

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 32.6 %
STANDARD DEVIATION IS 24.8
N IS 5.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 43.7 %
STANDARD DEVIATION IS 27.4 WITH N = 3
WINTER (NOV - APR) : 16.0 %
STANDARD DEVIATION IS 6.5 WITH N = 2

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 57.1 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 85.7 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 14.3 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 21.
 TOTAL # ANALYTICAL RESULTS : 304.
 TOTAL POSSIBLE # RESULTS : 504.
 PERCENT OF DATA RECOVERY : 60.32 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 43.06 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 96.21 %
 WINTER (NOV - APR) : 20.83 %

PARAMETER DATA RECOVERY

VOLUME : 90.48 %	CONDUCT : 52.38 %	PH LAB : 66.67 %
TOTAL H+ : 66.67 %	SULPHATE : 66.67 %	NITRATE : 66.67 %
CALCIUM : 57.14 %	CHLORIDE : 66.67 %	KJELDAHL AS N : 66.67 %
MAGNESIUM : 57.14 %	POTASSIUM : 61.90 %	SODIUM : 61.90 %
MANGANESE : 61.90 %	AMMONIUM : 66.67 %	PHOSPHOROUS : 52.38 %
NICKEL : 52.38 %	ZINC : 52.38 %	IRON : 52.38 %
LEAD : 52.38 %	VANADIUM : 52.38 %	ALUMINUM : 52.38 %
COPPER : 52.38 %	CADMIUM : 52.38 %	FREE H+ : 66.67 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	6	28.57
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	6	28.57
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	6	42.86
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	6	85.71

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	32	11.23
EXCEED GROSS LIMIT (G)	2	0.70
OUTLIER DIXON RATIO (D)	0	0.00
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	251	88.07

NETWORK TYPE : CUMULATIVE PRECIP

STATION # : 5091 Whitney

PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 40.

SAMPLES WITH FIELD COMMENTS : 27

SAMPLES WITH OFFICE/VALIDATION COMMENTS : 12

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	4	10.0
LEAVES(B)	2	5.0
PARTICULATES(C)	10	25.0
FIBRES(D)	0	0.0
NOT SUBMITTED(E OR I)	1	2.5
MALFUNCTION(F)	16	40.0
SPILL/LEAK(G OR H)	5	12.5
EVENTS MISSED(I)	7	17.5
WET SIDE OPEN(J)	5	12.5
NO PRECIP. COLLECTED(K)	1	2.5
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	4	10.0
AFFECTED (F,I,J,K,L,M,X,E)	16	40.0
UNAFFECTED (NO F,I,J,K,L,M,X,E)	24	60.0

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	97.5
SAMPLES WITH VOLUME REPORTED	39	97.5
SAMPLES WITH GDEP AND VOL	38	95.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 72.7 %
 STANDARD DEVIATION IS 23.1
 N IS 33.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 70.8 %
 STANDARD DEVIATION IS 25.2 WITH N = 22
 WINTER (NOV - APR) : 76.4 %
 STANDARD DEVIATION IS 18.7 WITH N = 11

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 44.7 %
 PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 23.7 %
 PERCENTAGE OF VALID EFFICIENCIES (50-120) : 76.3 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 40.
 TOTAL # ANALYTICAL RESULTS : 897.
 TOTAL POSSIBLE # RESULTS : 960.
 PERCENT OF DATA RECOVERY : 93.44 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 58.96 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 97.16 %
 WINTER (NOV - APR) : 88.89 %

PARAMETER DATA RECOVERY

VOLUME :	97.50 %	CONDUCT :	95.00 %	PH LAB :	95.00 %
TOTAL H+ :	92.50 %	SULPHATE :	95.00 %	NITRATE :	95.00 %
CALCIUM :	92.50 %	CHLORIDE :	95.00 %	KJELDAHL AS N :	92.50 %
MAGNESIUM :	92.50 %	POTASSIUM :	92.50 %	SODIUM :	92.50 %
MANGANESE :	95.00 %	AMMONIUM :	92.50 %	PHOSPHOROUS :	92.50 %
NICKEL :	92.50 %	ZINC :	92.50 %	IRON :	92.50 %
LEAD :	92.50 %	VANADIUM :	92.50 %	ALUMINUM :	92.50 %
COPPER :	92.50 %	CADMIUM :	92.50 %	FREE H+ :	95.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	3	7.50
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	3	7.50
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	3	7.89
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	6	15.79

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	3	0.35
EXCEED GROSS LIMIT (G)	7	0.82
OUTLIER DIXON RATIO (D)	2	0.23
EXCEED (G) AND (D)	3	0.35
UNAFFECTED SAMPLES (NO RESULT CODE)	843	98.25

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 5141 Turkey Lakes
PERIOD OF REPORT : 13 SEP 1983 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 18.
SAMPLES WITH FIELD COMMENTS : 11
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 1

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	1	5.6
LEAVES(B)	1	5.6
PARTICULATES(C)	6	33.3
FIBRES(D)	4	22.2
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	3	16.7
SPILL/LEAK(G OR H)	1	5.6
EVENTS MISSED(I)	1	5.6
WET SIDE OPEN(J)	3	16.7
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	1	5.6
AFFECTED (F,I,J,K,L,M,X,E)	5	27.8
UNAFFECTED (NO F,I,J,K,L,M,X,E)	13	72.2

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	18	100.0
SAMPLES WITH VOLUME REPORTED	18	100.0
SAMPLES WITH GDEP AND VOL	18	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 69.6 %
STANDARD DEVIATION IS 18.4
N IS 17.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 73.4 %
STANDARD DEVIATION IS 19.2 WITH N = 9
WINTER (NOV - APR) : 65.3 %
STANDARD DEVIATION IS 17.8 WITH N = 8

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 33.3 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 16.7 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 83.3 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 18.
 TOTAL # ANALYTICAL RESULTS : 415.
 TOTAL POSSIBLE # RESULTS : 432.
 PERCENT OF DATA RECOVERY : 96.06 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "B", "D" OR F,I,J,K,L,M) : 64.35 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 99.54 %
 WINTER (NOV - APR) : 92.59 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 88.89 %	PH LAB : 100.00 %
TOTAL H+ : 94.44 %	SULPHATE : 94.44 %	NITRATE : 94.44 %
CALCIUM : 100.00 %	CHLORIDE : 94.44 %	KJELDAHL AS N : 94.44 %
MAGNESIUM : 100.00 %	POTASSIUM : 100.00 %	SODIUM : 100.00 %
MANGANESE : 100.00 %	AMMONIUM : 94.44 %	PHOSPHOROUS : 94.44 %
NICKEL : 94.44 %	ZINC : 94.44 %	IRON : 94.44 %
LEAD : 94.44 %	VANADIUM : 94.44 %	ALUMINUM : 94.44 %
COPPER : 94.44 %	CADMIUM : 94.44 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	0	0.00
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	1	5.56
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	0	0.00

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	4	1.01
EXCEED GROSS LIMIT (G)	5	1.26
OUTLIER DIXON RATIO (D)	14	3.53
EXCEED (G) AND (D)	4	1.01
UNAFFECTED SAMPLES (NO RESULT CODE)	370	93.20

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 5151 *Azure Lake*
PERIOD OF REPORT : 24 JUL 1983 TO 10 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 19.
SAMPLES WITH FIELD COMMENTS : 12
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 5

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	3	15.8
LEAVES(B)	2	10.5
PARTICULATES(C)	8	42.1
FIBRES(D)	5	26.3
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	0	0.0
SPILL/LEAK(G OR H)	3	15.8
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	1	5.3
AFFECTED (F,I,J,K,L,M,X,E)	0	0.0
UNAFFECTED (NO F,I,J,K,L,M,X,E)	19	100.0

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	19	100.0
SAMPLES WITH VOLUME REPORTED	19	100.0
SAMPLES WITH GDEP AND VOL	19	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 72.6 %
STANDARD DEVIATION IS 14.1
N IS 14.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 72.6 %
STANDARD DEVIATION IS 17.6 WITH N = 8
WINTER (NOV - APR) : 72.6 %
STANDARD DEVIATION IS 9.4 WITH N = 6

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 15.8 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 26.3 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 73.7 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 19.
 TOTAL # ANALYTICAL RESULTS : 456.
 TOTAL POSSIBLE # RESULTS : 456.
 PERCENT OF DATA RECOVERY : 100.00 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 93.64 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 100.00 %
 WINTER (NOV - APR) : 100.00 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 100.00 %	PH LAB : 100.00 %
TOTAL H+ : 100.00 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 100.00 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 100.00 %
MAGNESIUM : 100.00 %	POTASSIUM : 100.00 %	SODIUM : 100.00 %
MANGANESE : 100.00 %	AMMONIUM : 100.00 %	PHOSPHOROUS : 100.00 %
NICKEL : 100.00 %	ZINC : 100.00 %	IRON : 100.00 %
LEAD : 100.00 %	VANADIUM : 100.00 %	ALUMINUM : 100.00 %
COPPER : 100.00 %	CADMIUM : 100.00 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	2	10.53
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	0	0.00
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	3	15.79

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	13	2.97
EXCEED GROSS LIMIT (G)	9	2.06
OUTLIER DIXON RATIO (D)	3	0.69
EXCEED (G) AND (D)	4	0.92
UNAFFECTED SAMPLES (NO RESULT CODE)	408	93.36

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 6011 Dorion
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 38.
SAMPLES WITH FIELD COMMENTS : 35
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 8

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	12	31.6
LEAVES(B)	0	0.0
PARTICULATES(C)	27	71.1
FIBRES(D)	19	50.0
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	5	13.2
SPILL/LEAK(G OR H)	1	2.6
EVENTS MISSED(I)	2	5.3
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	1	2.6
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	1	2.6
AFFECTED (F,I,J,K,L,M,X,E)	7	18.4
UNAFFECTED (NO F,I,J,K,L,M,X,E)	31	81.6

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	38	100.0
SAMPLES WITH VOLUME REPORTED	37	97.4
SAMPLES WITH GDEP AND VOL	37	97.4

AVERAGE SAMPLING EFFICIENCY (< 120; NO 6, H CODES) 80.5 %
STANDARD DEVIATION IS 14.3
N IS 36.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 82.5 %
STANDARD DEVIATION IS 15.4 WITH N = 22
WINTER (NOV - APR) : 77.4 %
STANDARD DEVIATION IS 12.4 WITH N = 14

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 18.9 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 5.4 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 94.6 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 38.
 TOTAL # ANALYTICAL RESULTS : 874.
 TOTAL POSSIBLE # RESULTS : 912.
 PERCENT OF DATA RECOVERY : 95.83 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 76.97 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 100.00 %
 WINTER (NOV - APR) : 90.10 %

PARAMETER DATA RECOVERY

VOLUME : 97.37 %	CONDUCT : 94.74 %	PH LAB : 97.37 %
TOTAL H+ : 92.11 %	SULPHATE : 97.37 %	NITRATE : 97.37 %
CALCIUM : 97.37 %	CHLORIDE : 97.37 %	KJELDAHL AS N : 94.74 %
MAGNESIUM : 97.37 %	POTASSIUM : 97.37 %	SODIUM : 97.37 %
MANGANESE : 97.37 %	AMMONIUM : 94.74 %	PHOSPHOROUS : 94.74 %
NICKEL : 94.74 %	ZINC : 94.74 %	IRON : 94.74 %
LEAD : 94.74 %	VANADIUM : 94.74 %	ALUMINUM : 94.74 %
COPPER : 94.74 %	CADMIUM : 94.74 %	FREE H+ : 97.37 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	3	7.89
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	3	7.89
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	3	8.11
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	2	5.41

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	15	1.79
EXCEED GROSS LIMIT (G)	7	0.84
OUTLIER DIXON RATIO (D)	4	0.48
EXCEED (G) AND (D)	3	0.36
UNAFFECTED SAMPLES (NO RESULT CODE)	808	96.54

NETWORK TYPE : CUMULATIVE PRECIP

STATION # : 6021 Nakina

PERIOD OF REPORT : 5 JAN 1982 TO 19 JUL 1983

TOTAL # OF SAMPLES COLLECTED : 21.

SAMPLES WITH FIELD COMMENTS : 20

SAMPLES WITH OFFICE/VALIDATION COMMENTS : 12

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	3	14.3
LEAVES(B)	0	0.0
PARTICULATES(C)	12	57.1
FIBRES(D)	16	76.2
NOT SUBMITTED(E OR I)	0	0.0
MALFUNCTION(F)	1	4.8
SPILL/LEAK(G OR H)	5	23.8
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	1	4.8
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	1	4.8
UNAFFECTED (NO F,I,J,K,L,M,X,E)	20	95.2

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	21	100.0
SAMPLES WITH VOLUME REPORTED	21	100.0
SAMPLES WITH GDEP AND VOL	21	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 74.2 %

STANDARD DEVIATION IS 17.7

N IS 16.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 83.3 %

STANDARD DEVIATION IS 10.3 WITH N = 9

WINTER (NOV - APR) : 62.6 %

STANDARD DEVIATION IS 19.0 WITH N = 7

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 23.8 %

PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 9.5 %

PERCENTAGE OF VALID EFFICIENCIES (50-120) : 90.5 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 21.
 TOTAL # ANALYTICAL RESULTS : 459.
 TOTAL POSSIBLE # RESULTS : 504.
 PERCENT OF DATA RECOVERY : 91.07 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 80.36 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 96.21 %
 WINTER (NOV - APR) : 85.42 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 85.71 %	PH LAB : 95.24 %
TOTAL H+ : 90.48 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 95.24 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 85.71 %
MAGNESIUM : 95.24 %	POTASSIUM : 95.24 %	SODIUM : 95.24 %
MANGANESE : 95.24 %	AMMONIUM : 85.71 %	PHOSPHOROUS : 85.71 %
NICKEL : 85.71 %	ZINC : 85.71 %	IRON : 85.71 %
LEAD : 85.71 %	VANADIUM : 85.71 %	ALUMINUM : 85.71 %
COPPER : 85.71 %	CADMIUM : 85.71 %	FREE H+ : 95.24 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	4	19.05
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	3	14.29
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	9	45.00
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	2	9.52

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	28	6.39
EXCEED GROSS LIMIT (G)	5	1.14
OUTLIER DIXON RATIO (D)	0	0.00
EXCEED (G) AND (D)	3	0.68
UNAFFECTED SAMPLES (NO RESULT CODE)	402	91.78

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 6031 Ear Falls
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 42.
SAMPLES WITH FIELD COMMENTS : 41
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 26

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	10	23.8
LEAVES(B)	3	7.1
PARTICULATES(C)	35	83.3
FIBRES(D)	18	42.9
NOT SUBMITTED(E OR I)	0	0.0
MAFUNCTION(F)	5	11.9
SPILL/LEAK(G OR H)	8	19.0
EVENTS MISSED(I)	3	7.1
WET SIDE OPEN(J)	3	7.1
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	5	11.9
AFFECTED (F,I,J,K,L,M,X,E)	6	14.3
UNAFFECTED (NO F,I,J,K,L,M,X,E)	36	85.7

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	42	100.0
SAMPLES WITH VOLUME REPORTED	42	100.0
SAMPLES WITH GDEP AND VOL	42	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 58.6 %
STANDARD DEVIATION IS 21.4
N IS 33.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 62.1 %
STANDARD DEVIATION IS 20.4 WITH N = 17
WINTER (NOV - APR) : 54.8 %
STANDARD DEVIATION IS 22.4 WITH N = 16

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 33.3 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 35.7 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 64.3 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 42.
 TOTAL # ANALYTICAL RESULTS : 827.
 TOTAL POSSIBLE # RESULTS : 1008.
 PERCENT OF DATA RECOVERY : 82.04 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 65.28 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 87.69 %
 WINTER (NOV - APR) : 75.83 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 78.57 %	PH LAB : 90.48 %
TOTAL H+ : 90.48 %	SULPHATE : 97.62 %	NITRATE : 97.62 %
CALCIUM : 76.19 %	CHLORIDE : 97.62 %	KJELDAHL AS N : 80.95 %
MAGNESIUM : 78.57 %	POTASSIUM : 78.57 %	SODIUM : 78.57 %
MANGANESE : 88.10 %	AMMONIUM : 80.95 %	PHOSPHOROUS : 73.81 %
NICKEL : 73.81 %	ZINC : 73.81 %	IRON : 73.81 %
LEAD : 73.81 %	VANADIUM : 73.81 %	ALUMINUM : 73.81 %
COPPER : 73.81 %	CADMIUM : 73.81 %	FREE H+ : 90.48 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	4	9.52
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	2	4.76
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	12	31.58
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	13	30.95

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	29	3.69
EXCEED GROSS LIMIT (G)	6	0.76
OUTLIER DIXON RATIO (D)	9	1.15
EXCEED (G) AND (D)	2	0.25
UNAFFECTED SAMPLES (NO RESULT CODE)	739	94.14

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 6041 *Pickle Lake*
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 38.
SAMPLES WITH FIELD COMMENTS : 37
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 17

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	7	18.4
LEAVES(B)	6	15.8
PARTICULATES(C)	34	89.5
FIBRES(D)	17	44.7
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	9	23.7
SPILL/LEAK(G OR H)	9	23.7
EVENTS MISSED(I)	1	2.6
WET SIDE OPEN(J)	7	18.4
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	5	13.2
AFFECTED (F,I,J,K,L,M,X,E)	12	31.6
UNAFFECTED (NO F,I,J,K,L,M,X,E)	26	68.4

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	38	100.0
SAMPLES WITH VOLUME REPORTED	38	100.0
SAMPLES WITH GDEP AND VOL	38	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 74.8 %
STANDARD DEVIATION IS 21.8
N IS 29.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 77.3 %
STANDARD DEVIATION IS 18.9 WITH N = 15
WINTER (NOV - APR) : 72.1 %
STANDARD DEVIATION IS 25.0 WITH N = 14

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 44.7 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 23.7 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 76.3 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 38.
 TOTAL # ANALYTICAL RESULTS : 876.
 TOTAL POSSIBLE # RESULTS : 912.
 PERCENT OF DATA RECOVERY : 96.05 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 62.28 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 99.38 %
 WINTER (NOV - APR) : 92.36 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 92.11 %	PH LAB : 92.11 %
TOTAL H+ : 94.74 %	SULPHATE : 97.37 %	NITRATE : 97.37 %
CALCIUM : 94.74 %	CHLORIDE : 97.37 %	KJELDAHL AS N : 94.74 %
MAGNESIUM : 94.74 %	POTASSIUM : 94.74 %	SODIUM : 94.74 %
MANGANESE : 97.37 %	AMMONIUM : 94.74 %	PHOSPHOROUS : 97.37 %
NICKEL : 97.37 %	ZINC : 97.37 %	IRON : 97.37 %
LEAD : 97.37 %	VANADIUM : 97.37 %	ALUMINUM : 97.37 %
COPPER : 97.37 %	CADMIUM : 97.37 %	FREE H+ : 92.11 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	7	18.42
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	6	15.79
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	8	22.86
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	6	15.79

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	26	3.10
EXCEED GROSS LIMIT (G)	8	0.95
OUTLIER DIXON RATIO (D)	8	0.95
EXCEED (G) AND (D)	2	0.24
UNAFFECTED SAMPLES (NO RESULT CODE)	794	94.75

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 6061 Lac La Croix
PERIOD OF REPORT : 16 FEB 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 37
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 22

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	5	12.8
LEAVES(B)	4	10.3
PARTICULATES(C)	22	56.4
FIBRES(D)	16	41.0
NOT SUBMITTED(E OR X)	1	2.6
MALFUNCTION(F)	1	2.6
SPILL/LEAK(G OR H)	15	38.5
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	1	2.6
NO PRECIP. COLLECTED(K)	1	2.6
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	2	5.1
AFFECTED (F,I,J,K,L,M,X,E)	4	10.3
UNAFFECTED (NO F,I,J,K,L,M,X,E)	35	89.7

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	100.0
SAMPLES WITH VOLUME REPORTED	36	92.3
SAMPLES WITH GDEP AND VOL	36	92.3

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 60.9 %
STANDARD DEVIATION IS 25.6
N IS 20.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 58.4 %
STANDARD DEVIATION IS 21.9 WITH N = 11
WINTER (NOV - APR) : 64.0 %
STANDARD DEVIATION IS 30.6 WITH N = 9

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 38.9 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 55.6 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 44.4 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
 TOTAL # ANALYTICAL RESULTS : 734.
 TOTAL POSSIBLE # RESULTS : 936.
 PERCENT OF DATA RECOVERY : 78.42 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 67.41 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 80.62 %
 WINTER (NOV - APR) : 75.26 %

PARAMETER DATA RECOVERY

VOLUME : 92.31 %	CONDUCT : 82.05 %	PH LAB : 84.62 %
TOTAL H+ : 79.49 %	SULPHATE : 87.18 %	NITRATE : 87.18 %
CALCIUM : 79.49 %	CHLORIDE : 87.18 %	KJELDAHL AS N : 76.92 %
MAGNESIUM : 79.49 %	POTASSIUM : 79.49 %	SODIUM : 79.49 %
MANGANESE : 79.49 %	AMMONIUM : 76.92 %	PHOSPHOROUS : 71.79 %
NICKEL : 71.79 %	ZINC : 71.79 %	IRON : 71.79 %
LEAD : 71.79 %	VANADIUM : 71.79 %	ALUMINUM : 71.79 %
COPPER : 71.79 %	CADMIUM : 71.79 %	FREE H+ : 84.62 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	3	7.69
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	3	7.69
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	8	24.24
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	16	44.44

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	35	5.01
EXCEED GROSS LIMIT (G)	5	0.72
OUTLIER DIXON RATIO (D)	9	1.29
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	649	92.98

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 6071 Quetico Centre
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 40.
SAMPLES WITH FIELD COMMENTS : 38
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 14

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	6	15.0
LEAVES(B)	2	5.0
PARTICULATES(C)	31	77.5
FIBRES(D)	15	37.5
NOT SUBMITTED(E OR I)	0	0.0
MALFUNCTION(F)	3	7.5
SPILL/LEAK(G OR H)	10	25.0
EVENTS MISSED(I)	1	2.5
WET SIDE OPEN(J)	1	2.5
NO PRECIP. COLLECTED(K)	1	2.5
DRY SIDE OPEN(M)	1	2.5
OTHER IN SAMPLE(Q)	1	2.5
AFFECTED (F,I,J,K,L,M,X,E)	4	10.0
UNAFFECTED (NO F,I,J,K,L,M,X,E)	36	90.0

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	39	97.5
SAMPLES WITH VOLUME REPORTED	39	97.5
SAMPLES WITH GDEP AND VOL	39	97.5

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 78.4 %
STANDARD DEVIATION IS 19.6
N IS 29.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 83.1 %
STANDARD DEVIATION IS 16.7 WITH N = 18
WINTER (NOV - APR) : 70.7 %
STANDARD DEVIATION IS 22.2 WITH N = 11

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 30.8 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 17.9 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 82.1 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 40.
 TOTAL # ANALYTICAL RESULTS : 878.
 TOTAL POSSIBLE # RESULTS : 960.
 PERCENT OF DATA RECOVERY : 91.46 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 82.71 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 95.45 %
 WINTER (NOV - APR) : 86.57 %

PARAMETER DATA RECOVERY

VOLUME : 97.50 %	CONDUCT : 90.00 %	PH LAB : 95.00 %
TOTAL H+ : 92.50 %	SULPHATE : 95.00 %	NITRATE : 95.00 %
CALCIUM : 95.00 %	CHLORIDE : 95.00 %	KJELDAHL AS N : 90.00 %
MAGNESIUM : 95.00 %	POTASSIUM : 95.00 %	SODIUM : 95.00 %
MANGANESE : 95.00 %	AMMONIUM : 87.50 %	PHOSPHOROUS : 87.50 %
NICKEL : 87.50 %	ZINC : 87.50 %	IRON : 87.50 %
LEAD : 87.50 %	VANADIUM : 87.50 %	ALUMINUM : 87.50 %
COPPER : 87.50 %	CADMIUM : 87.50 %	FREE H+ : 95.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	3	7.50
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	2	5.00
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	6	15.79
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	4	10.26

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	11	1.31
EXCEED GROSS LIMIT (G)	4	0.48
OUTLIER DIXON RATIO (D)	2	0.24
EXCEED (G) AND (D)	1	0.12
UNAFFECTED SAMPLES (NO RESULT CODE)	821	97.85

NETWORK TYPE : CUMULATIVE PRECIP

STATION # : 6091 E.L.A.

PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 41.

SAMPLES WITH FIELD COMMENTS : 37

SAMPLES WITH OFFICE/VALIDATION COMMENTS : 22

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	7	17.1
LEAVES(B)	0	0.0
PARTICULATES(C)	31	75.6
FIBRES(D)	20	48.8
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	8	19.5
SPILL/LEAK(G OR H)	11	26.8
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	4	9.8
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	3	7.3
AFFECTED (F,I,J,K,L,M,X,E)	8	19.5
UNAFFECTED (NO F,I,J,K,L,M,X,E)	33	80.5

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	41	100.0
SAMPLES WITH VOLUME REPORTED	40	97.6
SAMPLES WITH GDEP AND VOL	40	97.6

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 61.3 %

STANDARD DEVIATION IS 27.0

N IS 27.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 73.3 %

STANDARD DEVIATION IS 18.2 WITH N = 17

WINTER (NOV - APR) : 40.9 %

STANDARD DEVIATION IS 28.1 WITH N = 10

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 40.0 %

PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 37.5 %

PERCENTAGE OF VALID EFFICIENCIES (50-120) : 62.5 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 41.
 TOTAL # ANALYTICAL RESULTS : 831.
 TOTAL POSSIBLE # RESULTS : 984.
 PERCENT OF DATA RECOVERY : 84.45 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 63.21 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 94.89 %
 WINTER (NOV - APR) : 72.37 %

PARAMETER DATA RECOVERY

VOLUME : 97.56 %	CONDUCT : 80.49 %	PH LAB : 92.68 %
TOTAL H+ : 90.24 %	SULPHATE : 90.24 %	NITRATE : 90.24 %
CALCIUM : 82.93 %	CHLORIDE : 90.24 %	KJELDAHL AS N : 80.49 %
MAGNESIUM : 82.93 %	POTASSIUM : 82.93 %	SODIUM : 82.93 %
MANGANESE : 85.37 %	AMMONIUM : 80.49 %	PHOSPHOROUS : 80.49 %
NICKEL : 80.49 %	ZINC : 80.49 %	IRON : 80.49 %
LEAD : 80.49 %	VANADIUM : 80.49 %	ALUMINUM : 80.49 %
COPPER : 80.49 %	CADMIUM : 80.49 %	FREE H+ : 92.68 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	2	4.88
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	3	7.32
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	9	23.68
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	11	27.50

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	34	4.30
EXCEED GROSS LIMIT (G)	10	1.26
OUTLIER DIXON RATIO (D)	22	2.78
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	725	91.66

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 6101 Winisk
PERIOD OF REPORT : 20 JUL 1982 TO 28 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 27.
SAMPLES WITH FIELD COMMENTS : 13
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 14

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	5	18.5
LEAVES(B)	1	3.7
PARTICULATES(C)	3	11.1
FIBRES(D)	1	3.7
NOT SUBMITTED(E OR X)	1	3.7
MALFUNCTION(F)	3	11.1
SPILL/LEAK(G OR H)	4	14.8
EVENTS MISSED(I)	2	7.4
WET SIDE OPEN(J)	2	7.4
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	1	3.7
OTHER IN SAMPLE(Q)	1	3.7
AFFECTED (F,I,J,K,L,M,X,E)	5	18.5
UNAFFECTED (NO F,I,J,K,L,M,X,E)	22	81.5

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	17	63.0
SAMPLES WITH VOLUME REPORTED	25	92.6
SAMPLES WITH GDEP AND VOL	15	55.6

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 61.0 %
STANDARD DEVIATION IS 36.5
N IS 14.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 82.3 %
STANDARD DEVIATION IS 29.5 WITH N = 6
WINTER (NOV - APR) : 45.1 %
STANDARD DEVIATION IS 34.3 WITH N = 8

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 13.3 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 40.0 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 60.0 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 27.
 TOTAL # ANALYTICAL RESULTS : 534.
 TOTAL POSSIBLE # RESULTS : 648.
 PERCENT OF DATA RECOVERY : 82.41 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 61.88 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 92.26 %
 WINTER (NOV - APR) : 71.79 %

PARAMETER DATA RECOVERY

VOLUME : 92.59 %	CONDUCT : 85.19 %	PH LAB : 88.89 %
TOTAL H+ : 85.19 %	SULPHATE : 85.19 %	NITRATE : 85.19 %
CALCIUM : 77.78 %	CHLORIDE : 77.78 %	
MAGNESIUM : 77.78 %	POTASSIUM : 77.78 %	SODIUM : 77.78 %
MANGANESE : 81.48 %	AMMONIUM : 81.48 %	PHOSPHOROUS : 81.48 %
NICKEL : 81.48 %	ZINC : 81.48 %	IRON : 81.48 %
LEAD : 81.48 %	VANADIUM : 81.48 %	ALUMINUM : 81.48 %
COPPER : 81.48 %	CADMIUM : 81.48 %	FREE H+ : 88.89 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	6	22.22
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	6	22.22
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	8	33.33
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	2	13.33

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	51	10.02
EXCEED GROSS LIMIT (G)	5	0.98
OUTLIER DIXON RATIO (D)	0	0.00
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	453	89.00

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 6111 *Outer Island*
PERIOD OF REPORT : 24 APR 1984 TO 6 NOV 1984

TOTAL # OF SAMPLES COLLECTED : 7.
SAMPLES WITH FIELD COMMENTS : 7
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 1

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	2	28.6
LEAVES(B)	0	0.0
PARTICULATES(C)	4	57.1
FIBRES(D)	2	28.6
NOT SUBMITTED(E OR I)	0	0.0
MALFUNCTION(F)	4	57.1
SPILL/LEAK(G OR H)	0	0.0
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	4	57.1
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	2	28.6
AFFECTED (F,I,J,K,L,M,X,E)	5	71.4
UNAFFECTED (NO F,I,J,K,L,M,X,E)	2	28.6

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	7	100.0
SAMPLES WITH VOLUME REPORTED	7	100.0
SAMPLES WITH GDEP AND VOL	7	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 83.9 %
STANDARD DEVIATION IS 7.0
N IS 7.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 83.9 %
STANDARD DEVIATION IS 7.0 WITH N = 7
WINTER (NOV - APR) : 0.0 %
STANDARD DEVIATION IS 0.0 WITH N = 0

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 71.4 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 0.0 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 100.0 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 7.
 TOTAL # ANALYTICAL RESULTS : 168.
 TOTAL POSSIBLE # RESULTS : 168.
 PERCENT OF DATA RECOVERY : 100.00 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 25.00 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 100.00 %
 WINTER (NOV - APR) : 0.00 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 100.00 %	PH LAB : 100.00 %
TOTAL H+ : 100.00 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 100.00 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 100.00 %
MAGNESIUM : 100.00 %	POTASSIUM : 100.00 %	SODIUM : 100.00 %
MANGANESE : 100.00 %	AMMONIUM : 100.00 %	PHOSPHOROUS : 100.00 %
NICKEL : 100.00 %	ZINC : 100.00 %	IRON : 100.00 %
LEAD : 100.00 %	VANADIUM : 100.00 %	ALUMINUM : 100.00 %
COPPER : 100.00 %	CADMIUM : 100.00 %	FREE H+ : 100.00 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	0	0.00
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	0	0.00
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	1	14.29
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	0	0.00

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	3	1.86
EXCEED GROSS LIMIT (G)	6	3.73
OUTLIER DIXON RATIO (D)	3	1.86
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	149	92.55

NETWORK TYPE : CUMULATIVE PRECIP
STATION # : 6121 Geraldton
PERIOD OF REPORT : 16 AUG 1983 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 18.
SAMPLES WITH FIELD COMMENTS : 14
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 6

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	4	22.2
LEAVES(B)	0	0.0
PARTICULATES(C)	11	61.1
FIBRES(D)	4	22.2
NOT SUBMITTED(E OR X)	0	0.0
MALFUNCTION(F)	1	5.6
SPILL/LEAK(G OR H)	3	16.7
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	1	5.6
AFFECTED (F,I,J,K,L,M,X,E)	1	5.6
UNAFFECTED (NO F,I,J,K,L,M,X,E)	17	94.4

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	18	100.0
SAMPLES WITH VOLUME REPORTED	18	100.0
SAMPLES WITH GDEP AND VOL	18	100.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 68.6 %
STANDARD DEVIATION IS 19.6
N IS 15.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 74.0 %
STANDARD DEVIATION IS 17.7 WITH N = 8
WINTER (NOV - APR) : 62.5 %
STANDARD DEVIATION IS 21.2 WITH N = 7

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 16.7 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 27.8 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 77.8 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 18.
 TOTAL # ANALYTICAL RESULTS : 399.
 TOTAL POSSIBLE # RESULTS : 432.
 PERCENT OF DATA RECOVERY : 92.36 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 82.87 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 99.17 %
 WINTER (NOV - APR) : 83.85 %

PARAMETER DATA RECOVERY

VOLUME : 100.00 %	CONDUCT : 100.00 %	PH LAB : 94.44 %
TOTAL H+ : 94.44 %	SULPHATE : 100.00 %	NITRATE : 100.00 %
CALCIUM : 88.89 %	CHLORIDE : 100.00 %	KJELDAHL AS N : 94.44 %
MAGNESIUM : 88.89 %	POTASSIUM : 88.89 %	SODIUM : 88.89 %
MANGANESE : 88.89 %	AMMONIUM : 94.44 %	PHOSPHOROUS : 88.89 %
NICKEL : 88.89 %	ZINC : 88.89 %	IRON : 88.89 %
LEAD : 88.89 %	VANADIUM : 88.89 %	ALUMINUM : 88.89 %
COPPER : 88.89 %	CADMIUM : 88.89 %	FREE H+ : 94.44 %

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	2	11.11
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	1	5.56
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	3	17.65
NON-STANDARD COLLECTION PERIOD (Z)	0	0.00
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	4	22.22

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	12	3.15
EXCEED GROSS LIMIT (G)	3	0.79
OUTLIER DIXON RATIO (D)	1	0.26
EXCEED (G) AND (D)	1	0.26
UNAFFECTED SAMPLES (NO RESULT CODE)	364	95.54

APPENDIX 2

***** CUMWET COLOCATED SAMPLE *****

STATION : PORT STANLEY/CUMULATIVE PRECIP.

PERIOD : 831011 TO 841204 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES					DEPOSITION PERCENTILES				
	N	25TH	50TH	75TH	90TH	N	25TH	50TH	75TH	90TH
HT+	7	0.0202	0.0307	0.0544	0.0718	7	0.0032	0.0391	0.0480	0.0607
HF+	6	0.0230	0.0690	0.0920	0.0920	6	0.0119	0.0350	0.0557	0.1035
SD4--	7	0.0068	0.0290	0.0578	0.0811	7	0.0002	0.0016	0.0162	0.0170
N-ND3-	7	0.0000	0.0215	0.0382	0.0632	7	0.0054	0.0108	0.0194	0.0386
CA++	7	0.0000	0.0351	0.0365	0.0392	7	0.0239	0.0448	0.0809	0.0967
CL -	7	0.0000	0.0556	0.1429	0.2105	7	0.0021	0.0544	0.1309	0.1534
NNTKUR	7	0.0339	0.0813	0.0988	0.1935	7	0.0025	0.0716	0.1131	0.1391
MG++	7	0.0000	0.0541	0.2000	0.4615	7	0.0097	0.0809	0.1428	0.5157
KK+	7	0.0000	0.1053	0.5000	1.2000	7	0.0575	0.1265	0.4863	1.2506
NA	7	0.0000	0.1818	0.4000	1.0000	7	0.0120	0.1094	0.3860	1.0072
N-NH4+	7	0.0725	0.0732	0.1576	0.2069	7	0.0150	0.0607	0.1265	0.2147
PP	6	0.0000	0.1818	0.2857	1.0508	6	0.0120	0.2387	0.2952	1.0403
MN	7	0.0000	0.0000	0.1818	0.2222	7	0.0097	0.0576	0.2341	0.2822
NI	7	0.0000	0.0000	0.0000	0.0000	7	0.0097	0.0146	0.0576	0.0809
ZN	0	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
FE	7	0.1057	0.1259	0.1998	0.2486	7	0.0482	0.1124	0.2796	0.3481
PB	4	0.0734	0.1926	0.2455	0.2455	4	0.0879	0.1885	0.2045	0.2045
VV	7	0.0000	0.0000	0.0000	0.0000	7	0.0097	0.0146	0.0809	0.1017
AL	5	0.1426	0.1695	0.3295	0.4567	5	0.1122	0.1545	0.3201	0.5520
CU	4	0.0034	0.0037	0.0201	0.0201	4	0.0063	0.0063	0.0374	0.0374
CD	7	0.0000	0.0000	0.1176	0.6667	7	0.0097	0.0575	0.1705	0.6773
G-DEPTH	5	0.0000	0.0377	0.0417	0.0444					
S-DEPTH	7	0.0097	0.0146	0.0576	0.0809					

***** CUMWET COLOCATED SAMPLE *****

STATION : DORSET/CUMULATIVE PRECIP.

PERIOD : 820330 TO 841204 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES					DEPOSITION PERCENTILES				
	N	25TH	50TH	75TH	90TH	N	25TH	50TH	75TH	90TH
HT+	4	0.0132	0.0587	0.0782	0.0782	4	0.0132	0.0633	0.4752	0.4752
HF+	5	0.0230	0.0690	0.0690	0.0920	5	0.0690	0.0966	0.2712	0.3130
SD4--	5	0.0148	0.0290	0.0392	0.0476	5	0.0335	0.0476	0.1277	0.1677
N-ND3-	5	0.0000	0.0392	0.0654	0.0723	5	0.0000	0.0768	0.1277	0.2262
CA++	5	0.0000	0.2105	0.3704	0.3768	5	0.0000	0.0348	0.0887	0.2060
CL -	5	0.0741	0.1176	0.1333	0.1622	5	0.0291	0.0786	0.1299	0.1333
NNTKUR	5	0.0364	0.0759	0.1224	0.4466	5	0.0339	0.0409	0.0448	0.0759
MG++	5	0.0000	0.0000	0.0000	0.4000	5	0.0000	0.0045	0.1128	0.3142
KK+	4	0.0000	0.1538	0.4000	0.4000	4	0.0000	0.1591	0.4843	0.4843
NA	5	0.0000	0.0000	0.2857	0.5455	5	0.0000	0.2655	0.2902	0.4036
N-NH4+	5	0.0233	0.0632	0.1154	0.1314	5	0.0233	0.0677	0.1747	0.1766
PP	5	0.1053	0.2222	0.2500	0.6667	5	0.1343	0.2545	0.3928	0.6667
MN	4	0.0000	0.0000	0.4000	0.4000	4	0.0000	0.0886	0.6707	0.6707
NI	4	0.0000	0.0000	0.0000	0.0000	4	0.0000	0.0886	0.4038	0.4038
ZN	1	0.0000	0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000	0.0000
FE	3	0.0000	0.0003	0.4344	0.4344	3	0.0000	0.0003	0.0320	0.0320
PB	0	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
VV	4	0.0000	0.0000	0.0000	0.0000	4	0.0000	0.0045	0.0886	0.0886
AL	1	0.0000	0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000	0.0000
CU	2	0.0000	0.0238	0.0238	0.0238	2	0.0000	0.0649	0.0649	0.0649
CD	4	0.0000	0.0000	0.0000	0.0000	4	0.0000	0.0886	0.4038	0.4038
G-DEPTH	5	0.0000	0.0000	0.0000	0.0000					
S-DEPTH	5	0.0000	0.0045	0.0866	0.2905					

***** CUMWET COLOCATED SAMPLE *****

STATION : GOLDEN LAKE/CUMULATIVE PRECIP.

PERIOD : 831011 TO 841204 (800101-841231)

ABSOLUTE % DIFFERENCE $100 \times |C1 - C2| / [(C1 + C2) / 2]$

PARAMETERS	N	CONCENTRATION PERCENTILES				N	DEPOSITION PERCENTILES			
		25TH	50TH	75TH	90TH		25TH	50TH	75TH	90TH
MT+	12	0.0346	0.0483	0.1089	0.1348	12	0.0293	0.0661	0.1732	0.3127
MF+	12	0.0230	0.0920	0.2292	0.2519	12	0.0120	0.1192	0.2022	0.2444
SD4--	11	0.0112	0.0351	0.1116	0.1205	11	0.0047	0.0272	0.0396	0.0649
N-ND3-	11	0.0000	0.0247	0.0759	0.1143	11	0.0060	0.0279	0.0404	0.1142
CA++	11	0.0000	0.0571	0.0690	0.3158	11	0.0107	0.0492	0.0935	0.1388
CL -	11	0.0000	0.1176	0.2222	0.2500	11	0.0153	0.0683	0.2268	0.2554
NNTKUR	12	0.0000	0.1120	0.2642	0.6061	12	0.0810	0.1388	0.2491	0.3389
MG++	12	0.0000	0.1818	0.3636	0.4000	12	0.0492	0.1446	0.2847	0.2903
KK+	10	0.0000	0.4000	1.1111	1.1667	10	0.0374	0.4428	0.7485	0.9856
NA	11	0.1053	0.1818	0.6087	0.7500	11	0.0802	0.1217	0.3350	0.4088
N-NH4+	12	0.0417	0.0890	0.1875	0.2500	12	0.0650	0.1367	0.3378	0.3855
PP	12	0.2857	0.4444	0.6667	1.0000	12	0.2028	0.3466	0.6521	0.6654
MN	11	0.0000	0.0000	0.0000	0.0000	11	0.0153	0.0499	0.0986	0.1388
NI	11	0.0000	0.0000	0.0000	0.0000	11	0.0153	0.0499	0.5350	0.6121
ZN	0	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
FE	11	0.0524	0.2483	0.3216	0.5823	11	0.0162	0.0514	0.2703	0.2860
PB	6	0.0497	0.1596	0.2293	0.2493	6	0.1385	0.2024	0.2972	0.2983
VV	11	0.0000	0.0000	0.0000	0.0000	11	0.0153	0.0499	0.1388	0.4428
AL	4	0.0446	0.1534	0.3235	0.3235	4	0.0541	0.1593	0.3037	0.3037
CU	4	0.0052	0.0081	0.0317	0.0317	4	0.0102	0.0131	0.0493	0.0493
CD	11	0.0000	0.0000	0.0000	0.2857	11	0.0153	0.0810	0.2590	0.4428
G-DEPTH	8	0.0000	0.0000	0.1303	0.2400					
S-DEPTH	12	0.0153	0.0499	0.1368	0.4428					

***** CUMWET COLOCATED SAMPLE *****

STATION : MCKELLAR/CUMULATIVE PRECIP.

PERIOD : 831108 TO 841204 (800101-841231)

ABSOLUTE % DIFFERENCE $100 \times |C1 - C2| / [(C1 + C2) / 2]$

PARAMETERS	N	CONCENTRATION PERCENTILES				N	DEPOSITION PERCENTILES			
		25TH	50TH	75TH	90TH		25TH	50TH	75TH	90TH
MT+	11	0.0074	0.0819	0.3080	0.6510	11	0.0697	0.1163	0.3168	0.7439
MF+	10	0.0230	0.0920	0.1608	0.6024	10	0.0407	0.1434	0.3320	0.5945
SD4--	11	0.0124	0.0351	0.0870	0.1143	11	0.0086	0.0481	0.0746	0.3437
N-ND3-	11	0.0163	0.0513	0.0690	0.1161	11	0.0360	0.0502	0.1504	0.3336
CA++	11	0.0896	0.1622	0.4000	0.5882	11	0.0757	0.1396	0.5824	0.5897
CL -	11	0.0690	0.1667	0.4000	0.4000	11	0.0819	0.1118	0.4702	0.6120
NNTKUR	11	0.0241	0.2118	0.3333	0.4294	11	0.0540	0.2456	0.4783	0.6521
MG++	11	0.0000	0.2222	0.4615	1.0000	11	0.0867	0.2830	0.4330	1.2882
KK+	10	0.5352	1.3333	1.6667	1.6923	10	0.4870	1.4115	1.6329	1.7701
NA	11	0.1538	0.6667	0.8571	1.0476	11	0.1735	0.6971	1.0195	1.0941
N-NH4+	11	0.0225	0.0767	0.6923	1.0556	11	0.0423	0.1590	0.7914	0.9771
PP	11	0.0000	0.1818	0.7810	1.0476	11	0.0540	0.3096	1.0619	1.1831
MN	11	0.0000	0.0000	0.6667	0.6667	11	0.0198	0.0867	0.6182	1.0195
NI	11	0.0000	0.0000	0.0000	0.0000	11	0.0087	0.0515	0.3096	0.3161
ZN	1	0.0000	0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000	0.0000
FE	10	0.2354	0.4838	0.7868	0.8367	10	0.1809	0.2369	0.7123	0.8460
PB	8	0.0769	0.2606	0.3991	0.4040	8	0.0484	0.3142	0.3897	0.3956
VV	11	0.0000	0.0000	0.0000	0.0000	11	0.0087	0.0515	0.1057	0.3096
AL	9	0.0791	0.2645	0.6560	0.6816	9	0.0460	0.1655	0.3620	0.7037
CU	3	0.0000	0.0007	0.0778	0.0778	3	0.0000	0.0009	0.2332	0.2332
CD	11	0.0000	0.0000	0.6667	0.6667	11	0.0198	0.3096	0.6744	0.7121
G-DEPTH	6	0.0153	0.0625	0.0737	0.0870					
S-DEPTH	11	0.0087	0.0515	0.1057	0.3096					

***** CUMWET COLOCATED SAMPLE *****

STATION : DORION/CUMULATIVE PRECIP.

PERIOD : 840103 TO 841204

(800101-841231)

ABSOLUTE % DIFFERENCE $(C1-C2)/[(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES					DEPOSITION PERCENTILES				
	N	25TH	50TH	75TH	90TH	N	25TH	50TH	75TH	90TH
MT+	8	0.0090	0.0279	0.0734	0.0998	8	0.0332	0.0441	0.0580	0.0824
MF+	8	0.0460	0.0690	0.0920	0.0920	8	0.0477	0.0772	0.0974	0.1000
SO4--	8	0.0000	0.0215	0.0800	0.1455	8	0.0350	0.0426	0.0721	0.0885
N-NO3-	8	0.0000	0.0000	0.0370	0.0541	8	0.0307	0.0424	0.0620	0.0670
CA++	8	0.0000	0.0833	0.1622	0.4000	8	0.0163	0.0491	0.0873	0.3949
CL -	8	0.0000	0.0000	0.0741	0.1429	8	0.0163	0.0393	0.0670	0.1482
NNTKUR	8	0.0444	0.0706	0.1132	0.4348	8	0.0302	0.0759	0.1047	0.4272
MG++	8	0.0000	0.0000	0.0000	0.0000	8	0.0163	0.0426	0.0772	0.1133
KK+	7	0.0000	0.4000	1.0000	1.2000	7	0.0163	0.4407	0.9940	1.2701
NA	7	0.0000	0.2857	0.6032	0.6667	7	0.1133	0.2097	0.5959	0.6521
N-NH4+	8	0.0065	0.1449	0.2614	0.4000	8	0.0844	0.1057	0.2667	0.3024
PP	8	0.1714	0.3333	0.6667	0.7160	8	0.1661	0.3034	0.7091	0.7256
MN	6	0.0000	0.2957	0.4000	0.6667	8	0.0426	0.2900	0.4157	0.6714
NI	8	0.0000	0.0000	0.0000	0.2500	8	0.0163	0.0426	0.1133	0.2422
ZN	0	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
FE	7	0.0730	0.1196	0.2637	0.6009	7	0.0423	0.1675	0.2798	0.5619
PB	1	0.0000	0.0000	0.0000	0.0000	1	0.0000	0.0000	0.0000	0.0000
VV	8	0.0000	0.0000	0.0000	0.0000	8	0.0080	0.0307	0.0670	0.0772
AL	4	0.0366	0.0807	0.1346	0.1346	4	0.0222	0.0499	0.0576	0.0576
CU	4	0.0030	0.0077	0.0101	0.0101	4	0.0024	0.0086	0.0207	0.0207
CD	8	0.0000	0.0000	0.0000	0.0741	8	0.0053	0.0307	0.0670	0.1133
G-DEPTH	7	0.0000	0.0513	0.2174	0.3170					
S-DEPTH	8	0.0060	0.0307	0.0670	0.0772					

***** LOVOL COLOCATED SAMPLE *****

STATION : PORT STANLEY/CUMULATIVE/LO-VOL

PERIOD : 831011 TO 841204

(800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)]/23$

PARAMETERS	N	CONCENTRATION	PERCENTILES		
		25TH	50TH	75TH	90TH
SO2	11	0.0452	0.0920	0.1724	0.1912
SO4	11	0.0130	0.0756	0.2157	0.2212
NNRICF	11	0.0176	0.0768	0.2663	0.3447
N-NO3-	11	0.0353	0.0683	0.2281	0.3247
CA++	11	0.0125	0.1008	0.2274	0.2693
CL -	11	0.0082	0.0449	0.2157	0.3763
KK +	11	0.1259	0.2492	0.3402	0.3543
NA	11	0.0026	0.1258	0.3280	0.3891
FE	11	0.0085	0.1106	0.2815	0.3002
AL	11	0.0755	0.1022	0.2813	0.2984
MG	11	0.0064	0.0564	0.1811	0.2967
PB	11	0.0408	0.1013	0.2156	0.2466
MN	11	0.0380	0.0998	0.2695	0.2763
CU	11	0.0615	0.3603	0.4840	0.5061
NI	11	0.0623	0.3953	0.5776	0.7424
VV	11	0.0080	0.0615	0.3892	0.3937
ZN	11	0.0078	0.1409	0.3459	0.3712
CD	11	0.0197	0.0617	0.2155	0.2392

STATION : DORSET/CUMULATIVE/LO-VOL

PERIOD : 820817 TO 841204

(800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)]/23$

PARAMETERS	N	CONCENTRATION	PERCENTILES		
		25TH	50TH	75TH	90TH
SO2	15	0.0748	0.1600	0.5735	1.2267
SO4	13	0.0653	0.0984	0.1191	0.5084
NNRICF	13	0.0598	0.0983	0.1219	0.2051
N-NO3-	13	0.0260	0.0907	0.1699	0.2229
CA++	13	0.0567	0.1738	0.2446	0.3376
CL -	13	0.0206	0.0738	0.1551	0.3416
KK +	13	0.0881	0.1248	0.3796	0.6320
NA	13	0.0287	0.0663	0.1302	0.1769
FE	13	0.0287	0.1036	0.2191	0.3699
AL	13	0.0442	0.1338	0.2911	0.3823
MG	13	0.0921	0.1302	0.1711	0.2982
PB	13	0.0496	0.1338	0.2534	0.5294
MN	13	0.0681	0.0868	0.2008	0.2819
CU	13	0.2060	0.4755	0.5448	1.3165
NI	13	0.0697	0.3846	1.0614	1.6453
VV	13	0.0210	0.0862	0.0975	1.0031
ZN	13	0.0735	0.1400	0.2377	0.3201
CD	13	0.0878	0.1643	0.3326	0.6125

***** LOVOL COLLOCATED SAMPLE *****

STATION : CAMPBELLFORD/CUMULATIVE/LO-VOL

PERIOD : 840814 TO 841204 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)]/2$

PARAMETERS	CONCENTRATION PERCENTILES				
	N	25TH	50TH	75TH	90TH
SO2	2	0.0000	0.7167	0.7167	0.7167
SO4	2	0.0000	0.3787	0.3787	0.3787
NNRICF	2	0.0000	0.0684	0.0684	0.0684
N-NO3-	2	0.0000	0.8275	0.8275	0.8275
CA++	2	0.0000	0.0920	0.0920	0.0920
CL -	2	0.0000	0.4343	0.4343	0.4343
KK +	2	0.0000	0.3739	0.3739	0.3739
NA	2	0.0000	0.0334	0.0334	0.0334
FE	2	0.0000	0.0606	0.0606	0.0606
AL	2	0.0000	0.2312	0.2312	0.2312
MG	2	0.0000	0.0055	0.0055	0.0055
PB	2	0.0000	0.4887	0.4887	0.4887
MN	2	0.0000	0.0651	0.0651	0.0651
CU	2	0.0000	0.1599	0.1599	0.1599
NI	2	0.0000	0.1599	0.1599	0.1599
VV	2	0.0000	0.1600	0.1600	0.1600
ZN	2	0.0000	0.2967	0.2967	0.2967
CD	2	0.0000	0.1272	0.1272	0.1272

STATION : MCKELLAR/CUMULATIVE/LO-VOL

PERIOD : 831108 TO 841204 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)]/2$

PARAMETERS	CONCENTRATION PERCENTILES				
	N	25TH	50TH	75TH	90TH
SO2	9	0.0389	0.3214	1.1261	1.6026
SO4	9	0.0127	0.0395	0.7892	1.5525
NNRICF	9	0.0724	0.1486	0.6480	1.5503
N-NO3-	9	0.0819	0.2460	1.0692	1.5905
CA++	9	0.0317	0.0967	0.3340	1.2420
CL -	9	0.0519	0.1026	1.0240	1.5711
KK +	7	0.0575	0.4080	1.3610	1.4912
NA	9	0.0222	0.1444	0.2906	1.5732
FE	9	0.0365	0.0663	0.2663	1.5782
AL	9	0.0720	0.2663	0.6171	1.6014
MG	9	0.0318	0.1481	0.7561	1.4193
PB	9	0.0397	0.0754	0.1955	1.4579
MN	9	0.0885	0.1667	0.8212	1.6324
CU	9	0.0897	0.2389	0.4533	1.5172
NI	9	0.1666	0.5239	1.0040	1.6333
VV	9	0.1653	0.1738	0.3387	1.6328
ZN	9	0.0977	0.1946	0.5819	1.2078
CD	9	0.0843	0.2031	0.4912	1.4664

***** LOVOL COLOCATED SAMPLE *****

STATION : GERALDTON/CUMULATIVE/LD-VOL

PERIOD : 831206 TO 841204 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)/2]$

PARAMETERS	N	CONCENTRATION	PERCENTILES		
		25TH	50TH	75TH	90TH
SO2	13	0.0241	0.0984	0.5298	1.0931
SO4	12	0.0744	0.1009	0.3383	0.7879
NNRICF	13	0.0492	0.0837	0.2241	0.9031
N-NO3-	12	0.0249	0.0902	0.3496	0.4063
CA++	13	0.0763	0.2493	0.3854	0.8138
CL -	12	0.0133	0.0922	0.1913	0.2270
KK +	13	0.1418	0.3927	0.5104	0.9332
NA	13	0.0398	0.1286	0.2411	0.6826
FE	13	0.1136	0.3141	0.7278	0.7888
AL	13	0.0394	0.1759	0.3478	0.7802
MG	13	0.1257	0.1595	0.5103	0.9704
PB	13	0.2033	0.3321	0.5449	0.9726
MN	13	0.1170	0.1706	0.2546	0.5622
CU	13	0.0379	0.2467	0.8632	1.2833
NI	13	0.0317	0.2339	1.0050	1.6338
VV	13	0.0115	0.0318	0.1170	0.1705
ZN	13	0.2191	0.2968	0.8140	1.2114
CD	13	0.0180	0.5626	1.0050	1.4967

APPENDIX 3

NETWORK TYPE : CUMULATIVE AIR
STATION # : NETWORK
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 857.
SAMPLES WITH FIELD COMMENTS : 245
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 143
AVERAGE AIR SAMPLING VOLUME(LITRES) : 73411.9
STANDARD DEVIATION : 15458.2
N IS : 710.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	67	7.8
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	97	11.3
FLOW VOLUME SUSPECT(C)	34	4.0
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	32	3.7
FILTER PLACEMENT INCORRECT(E)	7	0.8
SAMPLE NOT SUBMITTED(F,K)	9	1.1
OTHERS(Q)	0	1.8

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 857.
TOTAL # ANALYTICAL RESULTS : 14187.
TOTAL POSSIBLE # RESULTS : 15426.
PERCENT OF DATA RECOVERY : 91.97 %
PERCENT OF VALID DATA RECOVERY : 87.25 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	51	5.95
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	103	12.02

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	318	2.24
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	310	2.19

NETWORK TYPE : CUMULATIVE AIR
STATION # : 1041 Colchester
PERIOD OF REPORT : 5 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 14
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 4
AVERAGE AIR SAMPLING VOLUME (LITRES) : 74219.9
STANDARD DEVIATION : 9635.9
N IS : 33.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	2	5.1
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	0	0.0
FLOW VOLUME SUSPECT(C)	4	10.3
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	7	17.9
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	5.1

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 635.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 90.46 %
PERCENT OF VALID DATA RECOVERY : 87.18 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	1	2.56
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	3	7.69

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	5	0.79
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (B)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	12	1.89

NETWORK TYPE : CUMULATIVE AIR
STATION # : 1061 Port Stanley
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 11
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 1
AVERAGE AIR SAMPLING VOLUME (LITRES) : 72900.8
STANDARD DEVIATION : 10269.5
N IS : 38.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	1	2.6
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	5	12.8
FLOW VOLUME SUSPECT(C)	2	5.1
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT(E)	2	5.1
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	5.1

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 671.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 95.58 %
PERCENT OF VALID DATA RECOVERY : 92.31 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	1	2.56
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	0	0.00

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	5	0.75
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	11	1.64

NETWORK TYPE : CUMULATIVE AIR
STATION # : 1071 Wilkesport
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 38.
SAMPLES WITH FIELD COMMENTS : 20
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 12
AVERAGE AIR SAMPLING VOLUME (LITRES) : 66294.8
STANDARD DEVIATION : 18850.8
M IS : 27.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MalfUNCTIONED(A)	4	10.5
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	8	21.1
FLOW VOLUME SUSPECT(C)	3	7.9
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	4	10.5
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	1	2.6
OTHERS(Q)	0	2.6

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 38.
TOTAL # ANALYTICAL RESULTS : 568.
TOTAL POSSIBLE # RESULTS : 684.
PERCENT OF DATA RECOVERY : 83.04 %
PERCENT OF VALID DATA RECOVERY : 69.44 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	7	18.42
SAMPLE LOST (I)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	6	15.79

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	21	3.70
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	5	0.88

NETWORK TYPE : CUMULATIVE AIR
STATION # : 1091 Shallow Lake
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 14
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 6
AVERAGE AIR SAMPLING VOLUME (LITRES) : 71158.6
STANDARD DEVIATION : 10789.1
M IS : 32.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS (CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED (A)	2	5.1
HYDRO FAILURE (KNOWN/SUSPECTED) (B)	2	5.1
FLOW VOLUME SUSPECT (C)	3	7.7
CONTAMINATION (KNOWN/SUSPECTED) (D,H,I)	5	12.8
FILTER PLACEMENT INCORRECT (E)	0	0.0
SAMPLE NOT SUBMITTED (F,K)	2	5.1
OTHERS (Q)	0	5.1

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 675.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 96.15 %
PERCENT OF VALID DATA RECOVERY : 95.58 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	0	0.00
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	6	15.38

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	4	0.59
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	5	0.74

NETWORK TYPE : CUMULATIVE AIR
STATION # : 1101 Palmerston
PERIOD OF REPORT : 5 JAN 1982 TO 31 DEC 1984

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 12
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 10
AVERAGE AIR SAMPLING VOLUME (LITRES) : 72456.7
STANDARD DEVIATION : 10245.6
IS : 30.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	3	7.7
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	3	7.7
FLOW VOLUME SUSPECT(C)	2	5.1
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	2	5.1
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	1	2.6
OTHERS(Q)	0	5.1

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 655.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 93.30 %
PERCENT OF VALID DATA RECOVERY : 90.46 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	3	7.69
SAMPLE LOST (I)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	7	17.95

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	2	0.31
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIION RATIO LIMIT (D)	15	2.29

NETWORK TYPE : CUMULATIVE AIR
STATION # : 3011 Dorset
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 4
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 2
AVERAGE AIR SAMPLING VOLUME (LITRES) : 78310.7
STANDARD DEVIATION : 5303.7
M IS : 36.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	3	7.7
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	1	2.6
FLOW VOLUME SUSPECT(C)	0	0.0
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 677.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 96.44 %
PERCENT OF VALID DATA RECOVERY : 96.44 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	0	0.00
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	2	5.13

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	0	0.00
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	6	0.89

NETWORK TYPE : CUMULATIVE AIR
STATION # : 3051 Milton
PERIOD OF REPORT : 5 JAN 1982 TO 27 MAR 1984

TOTAL # OF SAMPLES COLLECTED : 29.
SAMPLES WITH FIELD COMMENTS : 12
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 3
AVERAGE AIR SAMPLING VOLUME (LITRES) : 67567.8
STANDARD DEVIATION : 16545.6
N IS : 23.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	6	20.7
HYDRO FAILURE (KNOWN/SUSPECTED) (B)	8	27.6
FLOW VOLUME SUSPECT (C)	1	3.4
CONTAMINATION (KNOWN/SUSPECTED) (D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT (E)	0	0.0
SAMPLE NOT SUBMITTED (F,K)	0	0.0
OTHERS (Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 29.
TOTAL # ANALYTICAL RESULTS : 400.
TOTAL POSSIBLE # RESULTS : 522.
PERCENT OF DATA RECOVERY : 76.63 %
PERCENT OF VALID DATA RECOVERY : 66.86 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	2	6.90
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	1	3.45

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	16	4.00
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	22	5.50

NETWORK TYPE : CUMULATIVE AIR
STATION # : 3061 Uxbridge
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 37.
SAMPLES WITH FIELD COMMENTS : 6
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 3
AVERAGE AIR SAMPLING VOLUME (LITRES) : 66278.1
STANDARD DEVIATION : 15408.9
M IS : 36.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MalfUNCTIONED(A)	5	13.5
HYDRO FAILURE (KNOWN/SUSPECTED) (B)	0	0.0
FLOW VOLUME SUSPECT (C)	1	2.7
CONTAMINATION (KNOWN/SUSPECTED) (D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT (E)	0	0.0
SAMPLE NOT SUBMITTED (F,K)	0	0.0
OTHERS (Q)	0	2.7

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 37.
TOTAL # ANALYTICAL RESULTS : 640.
TOTAL POSSIBLE # RESULTS : 666.
PERCENT OF DATA RECOVERY : 96.10 %
PERCENT OF VALID DATA RECOVERY : 89.34 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	3	8.11
SAMPLE LOST (I)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	0	0.00

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	27	4.22
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	20	3.13

NETWORK TYPE : CUMULATIVE AIR
STATION # : 3081 Campbellford
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 8
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 3
AVERAGE AIR SAMPLING VOLUME (LITRES) : 73865.7
STANDARD DEVIATION : 19222.2
N IS : 35.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	6	15.4
HYDRO FAILURE(KNOWN/SUSPECTED) (B)	3	7.7
FLOW VOLUME SUSPECT(C)	1	2.6
CONTAMINATION(KNOWN/SUSPECTED) (D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	1	2.6
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 622.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 86.60 %
PERCENT OF VALID DATA RECOVERY : 85.61 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	3	7.69
SAMPLE LOST (I)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	0	0.00

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	21	3.38
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	10	1.61

NETWORK TYPE : CUMULATIVE AIR
STATION # : 4051 Kaladar
PERIOD OF REPORT : 5 JAN 1982 TO 10 NOV 1982

TOTAL # OF SAMPLES COLLECTED : 11.
SAMPLES WITH FIELD COMMENTS : 0
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 3
AVERAGE AIR SAMPLING VOLUME(LITRES) : 71681.4
STANDARD DEVIATION : 13256.7
M IS : 7.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	0	0.0
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	0	0.0
FLOW VOLUME SUSPECT(C)	0	0.0
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 11.
TOTAL # ANALYTICAL RESULTS : 155.
TOTAL POSSIBLE # RESULTS : 198.
PERCENT OF DATA RECOVERY : 78.28 %
PERCENT OF VALID DATA RECOVERY : 77.78 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	1	9.09
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	2	18.18

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	1	0.65
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	0	0.00

NETWORK TYPE : CUMULATIVE AIR
STATION # : 4061 Smith Falls
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 8
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 2
AVERAGE AIR SAMPLING VOLUME(LITRES) : 87118.3
STANDARD DEVIATION : 13785.9
N IS : 36.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	3	7.7
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	3	7.7
FLOW VOLUME SUSPECT(C)	1	2.6
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	2	5.1
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	1	2.6
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 613.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 87.32 %
PERCENT OF VALID DATA RECOVERY : 83.62 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	2	5.13
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	0	0.00

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	26	4.24
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	10	1.63

NETWORK TYPE : CUMULATIVE AIR
STATION # : 4071 Dalhousie Mills
PERIOD OF REPORT : 12 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 10
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 3
AVERAGE AIR SAMPLING VOLUME (LITRES) : 69961.7
STANDARD DEVIATION : 11242.5
N IS : 35.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MalfUNCTIONED(A)	2	5.1
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	9	23.1
FLOW VOLUME SUSPECT(C)	1	2.6
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 655.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 93.30 %
PERCENT OF VALID DATA RECOVERY : 92.45 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	0	0.00
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	3	7.69

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	6	0.92
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	28	4.27

NETWORK TYPE : CUMULATIVE AIR
STATION # : 4081 Golden Lake
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 7
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 0
AVERAGE AIR SAMPLING VOLUME (LITRES) : 71279.2
STANDARD DEVIATION : 13495.8
N IS : 38.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	2	5.1
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	4	10.3
FLOW VOLUME SUSPECT(C)	0	0.0
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	1	2.6
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 659.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 93.87 %
PERCENT OF VALID DATA RECOVERY : 93.59 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	0	0.00
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	0	0.00

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	2	0.30
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	4	0.61

NETWORK TYPE : CUMULATIVE AIR
STATION # : 5011 McKellar
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 11
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 10
AVERAGE AIR SAMPLING VOLUME (LITRES) : 74367.4
STANDARD DEVIATION : 28669.3
N IS : 32.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	5	12.8
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	5	12.8
FLOW VOLUME SUSPECT(C)	1	2.6
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT(E)	1	2.6
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 660.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 94.02 %
PERCENT OF VALID DATA RECOVERY : 86.04 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	4	10.26
SAMPLE LOST (I)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	6	15.38

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	22	3.33
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	6	0.91

NETWORK TYPE : CUMULATIVE AIR
STATION # : 5021 Killarney
PERIOD OF REPORT : 13 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 8
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 15
AVERAGE AIR SAMPLING VOLUME(LITRES) : 73991.7
STANDARD DEVIATION : 24293.9
M IS : 27.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MalfUNCTIONED(A)	3	7.7
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	3	7.7
FLOW VOLUME SUSPECT(C)	2	5.1
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	2.6

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 694.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 98.86 %
PERCENT OF VALID DATA RECOVERY : 88.18 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	3	7.69
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	12	30.77

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	27	3.89
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	17	2.45

NETWORK TYPE : CUMULATIVE AIR
STATION # : 5031 Mattawa
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 5
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 12
AVERAGE AIR SAMPLING VOLUME (LITRES) : 76332.0
STANDARD DEVIATION : 16643.5
M IS : 27.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MalfUNCTIONED(A)	1	2.6
HYDRO FAILURE (KNOWN/SUSPECTED) (B)	2	5.1
FLOW VOLUME SUSPECT (C)	1	2.6
CONTAMINATION (KNOWN/SUSPECTED) (D,H,I)	1	2.6
FILTER PLACEMENT INCORRECT (E)	1	2.6
SAMPLE NOT SUBMITTED (F,K)	0	0.0
OTHERS (Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 679.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 96.72 %
PERCENT OF VALID DATA RECOVERY : 93.87 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	1	2.56
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	11	28.21

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	4	0.59
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	45	6.63

NETWORK TYPE : CUMULATIVE AIR
STATION # : 5061 *Gowgande*
PERIOD OF REPORT : 7 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 37.
SAMPLES WITH FIELD COMMENTS : 3
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 6
AVERAGE AIR SAMPLING VOLUME(LITRES) : 74807.6
STANDARD DEVIATION : 21346.2
N IS : 34.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	1	2.7
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	1	2.7
FLOW VOLUME SUSPECT(C)	0	0.0
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT(E)	1	2.7
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	2.7

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 37.
TOTAL # ANALYTICAL RESULTS : 659.
TOTAL POSSIBLE # RESULTS : 666.
PERCENT OF DATA RECOVERY : 98.95 %
PERCENT OF VALID DATA RECOVERY : 90.54 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	3	8.11
SAMPLE LOST (I)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	3	8.11

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	20	3.03
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	20	3.03

NETWORK TYPE : CUMULATIVE AIR
STATION # : 5071 Moonbeam
PERIOD OF REPORT : 5 JAN 1982 TO 3 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 5
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 12
AVERAGE AIR SAMPLING VOLUME (LITRES) : 75905.9
STANDARD DEVIATION : 10763.8
N IS : 26.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	5	12.8
HYDRO FAILURE (KNOWN/SUSPECTED) (B)	0	0.0
FLOW VOLUME SUSPECT (C)	0	0.0
CONTAMINATION (KNOWN/SUSPECTED) (D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT (E)	0	0.0
SAMPLE NOT SUBMITTED (F,K)	1	2.6
OTHERS (Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 635.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 90.46 %
PERCENT OF VALID DATA RECOVERY : 87.04 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	3	7.69
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	11	28.21

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	6	0.94
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	16	2.52

NETWORK TYPE : CUMULATIVE AIR
STATION # : 5081 Attawapiskat
PERIOD OF REPORT : 9 JAN 1982 TO 28 FEB 1984

TOTAL # OF SAMPLES COLLECTED : 22.
SAMPLES WITH FIELD COMMENTS : 15
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 18
AVERAGE AIR SAMPLING VOLUME (LITRES) : 60087.7
STANDARD DEVIATION : 29269.3
M IS : 4.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	3	13.6
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	6	27.3
FLOW VOLUME SUSPECT(C)	2	9.1
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	1	4.5
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 22.
TOTAL # ANALYTICAL RESULTS : 264.
TOTAL POSSIBLE # RESULTS : 396.
PERCENT OF DATA RECOVERY : 66.67 %
PERCENT OF VALID DATA RECOVERY : 43.18 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	8	36.36
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	14	63.64

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	33	12.50
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	0	0.00

NETWORK TYPE : CUMULATIVE AIR
STATION # : 5141 Turkey Lakes
PERIOD OF REPORT : 8 NOV 1983 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 15.
SAMPLES WITH FIELD COMMENTS : 5
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 0
AVERAGE AIR SAMPLING VOLUME(LITRES) : 71772.2
STANDARD DEVIATION : 4257.3
N IS : 15.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	0	0.0
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	3	20.0
FLOW VOLUME SUSPECT(C)	1	6.7
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT(E)	1	6.7
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 15.
TOTAL # ANALYTICAL RESULTS : 270.
TOTAL POSSIBLE # RESULTS : 270.
PERCENT OF DATA RECOVERY : 100.00 %
PERCENT OF VALID DATA RECOVERY : 100.00 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	0	0.00
SAMPLE LOST (I)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	0	0.00

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	0	0.00
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	2	0.74

NETWORK TYPE : CUMULATIVE AIR
STATION # : 6011 Dorion
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 19
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 0
AVERAGE AIR SAMPLING VOLUME(LITRES) : 74059.4
STANDARD DEVIATION : 7985.8
M IS : 36.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	3	7.7
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	12	30.8
FLOW VOLUME SUSPECT(C)	1	2.6
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	5	12.8
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	1	2.6
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 641.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 91.31 %
PERCENT OF VALID DATA RECOVERY : 91.03 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	0	0.00
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	0	0.00

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	2	0.31
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	14	2.18

NETWORK TYPE : CUMULATIVE AIR
STATION # : 6021 Nolina
PERIOD OF REPORT : 5 JAN 1982 TO 19 JUL 1983

TOTAL # OF SAMPLES COLLECTED : 20.
SAMPLES WITH FIELD COMMENTS : 10
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 2
AVERAGE AIR SAMPLING VOLUME (LITRES) : 73114.4
STANDARD DEVIATION : 5036.0
N IS : 18.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	0	0.0
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	8	40.0
FLOW VOLUME SUSPECT(C)	0	0.0
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	1	5.0
FILTER PLACEMENT INCORRECT(E)	1	5.0
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 20.
TOTAL # ANALYTICAL RESULTS : 349.
TOTAL POSSIBLE # RESULTS : 360.
PERCENT OF DATA RECOVERY : 96.94 %
PERCENT OF VALID DATA RECOVERY : 96.11 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	0	0.00
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	2	10.00

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	3	0.86
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	10	2.87

NETWORK TYPE : CUMULATIVE AIR
STATION # : 6031 Ear Falls
PERIOD OF REPORT : 12 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 39.
SAMPLES WITH FIELD COMMENTS : 15
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 4
AVERAGE AIR SAMPLING VOLUME(LITRES) : 74957.6
STANDARD DEVIATION : 12405.6
M IS : 32.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	0	0.0
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	6	15.4
FLOW VOLUME SUSPECT(C)	1	2.6
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	2	5.1
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	5.1

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 39.
TOTAL # ANALYTICAL RESULTS : 634.
TOTAL POSSIBLE # RESULTS : 702.
PERCENT OF DATA RECOVERY : 90.31 %
PERCENT OF VALID DATA RECOVERY : 89.46 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	0	0.00
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	4	10.26

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	6	0.95
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	4	0.63

NETWORK TYPE : CUMULATIVE AIR
STATION # : 6041 Pickle Lake
PERIOD OF REPORT : 5 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 38.
SAMPLES WITH FIELD COMMENTS : 13
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 12
AVERAGE AIR SAMPLING VOLUME (LITRES) : 69830.2
STANDARD DEVIATION : 16000.4
M IS : 28.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	5	13.2
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	2	5.3
FLOW VOLUME SUSPECT(C)	2	5.3
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	0	0.0
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	2.6

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 38.
TOTAL # ANALYTICAL RESULTS : 631.
TOTAL POSSIBLE # RESULTS : 684.
PERCENT OF DATA RECOVERY : 92.25 %
PERCENT OF VALID DATA RECOVERY : 80.85 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	6	15.79
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	10	26.32

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	59	9.35
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	11	1.74

NETWORK TYPE : CUMULATIVE AIR
STATION # : 6111 Otter Island
PERIOD OF REPORT : 24 APR 1984 TO 6 NOV 1984

TOTAL # OF SAMPLES COLLECTED : 7.
SAMPLES WITH FIELD COMMENTS : 5
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 0
AVERAGE AIR SAMPLING VOLUME(LITRES) : 70245.2
STANDARD DEVIATION : 9462.1
M IS : 7.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	0	0.0
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	1	14.3
FLOW VOLUME SUSPECT(C)	3	42.9
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	1	14.3
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 7.
TOTAL # ANALYTICAL RESULTS : 125.
TOTAL POSSIBLE # RESULTS : 126.
PERCENT OF DATA RECOVERY : 99.21 %
PERCENT OF VALID DATA RECOVERY : 99.21 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	0	0.00
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	0	0.00

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	0	0.00
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	10	8.00

NETWORK TYPE : CUMULATIVE AIR
STATION # : 6121 Geraldton
PERIOD OF REPORT : 16 AUG 1983 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 18.
SAMPLES WITH FIELD COMMENTS : 5
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 0
AVERAGE AIR SAMPLING VOLUME (LITRES) : 79007.4
STANDARD DEVIATION : 9642.0
N IS : 18.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	2	11.1
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	2	11.1
FLOW VOLUME SUSPECT(C)	1	5.6
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	1	5.6
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 18.
TOTAL # ANALYTICAL RESULTS : 321.
TOTAL POSSIBLE # RESULTS : 324.
PERCENT OF DATA RECOVERY : 99.07 %
PERCENT OF VALID DATA RECOVERY : 99.07 %
NO "U" & NO "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	0	0.00
SAMPLE LOST (I)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	0	0.00

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	0	0.00
NOT CORRECTED FOR PASSIVE (P)	0	0.00
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
EXCEED DIXON RATIO LIMIT (D)	7	2.18

APPENDIX 4

NETWORK TYPE : DAILY PRECIP
STATION # : NETWORK
PERIOD OF REPORT : 2 JAN 1982 TO 16 NOV 1984

TOTAL # OF SAMPLES COLLECTED : 5584.
SAMPLES WITH FIELD COMMENTS : 2513
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 2012

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	147	2.6
LEAVES(B)	47	0.8
PARTICULATES(C)	1380	24.7
FIBRES(D)	588	10.5
NOT SUBMITTED(E OR X)	642	11.5
MALFUNCTION(F)	205	3.7
SPILL/LEAK(G OR H)	102	1.8
EVENTS MISSED(I)	115	2.1
WET SIDE OPEN(J)	52	0.9
NO PRECIP. COLLECTED(K)	256	4.6
DRY SIDE OPEN(M)	4	0.1
OTHER IN SAMPLE(Q)	58	1.0
AFFECTED (F,I,J,K,L,M,X,E)	782	14.0
UNAFFECTED (NO F,I,J,K,L,M,X,E)	4802	86.0

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	5302	94.9
SAMPLES WITH VOLUME REPORTED	5067	90.7
SAMPLES WITH GDEP AND VOL	4834	86.6

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 78.5 %
STANDARD DEVIATION IS 27.5
N IS 4079.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 84.5 %
STANDARD DEVIATION IS 23.1 WITH N = 2334
WINTER (NOV - APR) : 70.5 %
STANDARD DEVIATION IS 30.7 WITH N = 1745

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 4.0 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR M) : 31.3 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 70.6 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 5584.
 TOTAL # ANALYTICAL RESULTS : 57171.
 TOTAL POSSIBLE # RESULTS : 78176.
 PERCENT OF DATA RECOVERY : 73.13 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 66.96 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 79.63 %
 WINTER (NOV - APR) : 67.04 %

PARAMETER DATA RECOVERY

VOLUME :	90.74 %	CONDUCT :	63.11 %	PH FIELD :	36.32 %
PH LAB :	84.12 %	TOTAL H+ :	81.00 %	SULPHATE :	80.78 %
NITRATE :	80.75 %	CALCIUM :	67.89 %	CHLORIDE :	80.30 %
MAGNESIUM :	67.91 %	POTASSIUM :	68.03 %	SODIUM :	67.96 %
AMMONIUM :	70.81 %	FREE H+ :	84.12 %		

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	250	7.09
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	255	12.67
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	349	6.25
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	437	9.30
NON-STANDARD COLLECTION PERIOD (Z)	113	2.02
NON-STANDARD SAMPLING PERIOD (Y)	40	0.72
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	1124	23.25

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	1882	3.61
EXCEED GROSS LIMIT (G)	960	1.84
OUTLIER DIXON RATIO (D)	462	0.89
EXCEED (G) AND (D)	111	0.21
UNAFFECTED SAMPLES (NO RESULT CODE)	48689	93.45

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 36.3 %

NETWORK TYPE : DAILY PRECIP
STATION # : 1011 Longwoods
PERIOD OF REPORT : 2 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 373.
SAMPLES WITH FIELD COMMENTS : 252
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 121

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	10	2.7
LEAVES(B)	4	1.1
PARTICULATES(C)	194	52.0
FIBRES(D)	55	14.7
NOT SUBMITTED(E OR X)	35	9.4
MALFUNCTION(F)	6	1.6
SPILL/LEAK(G OR H)	4	1.1
EVENTS MISSED(I)	25	6.7
WET SIDE OPEN(J)	2	0.5
NO PRECIP. COLLECTED(K)	25	6.7
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	2	0.5
AFFECTED (F,I,J,K,L,M,X,E)	44	11.8
UNAFFECTED (NO F,I,J,K,L,M,X,E)	329	88.2

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	347	93.0
SAMPLES WITH VOLUME REPORTED	340	91.2
SAMPLES WITH GDEP AND VOL	317	85.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 82.9 %
STANDARD DEVIATION IS 26.1
N IS 267.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 85.7 %
STANDARD DEVIATION IS 21.9 WITH N = 144
WINTER (NOV - APR) : 79.7 %
STANDARD DEVIATION IS 30.2 WITH N = 123

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 2.5 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 28.7 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 73.8 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 373.
 TOTAL # ANALYTICAL RESULTS : 3844.
 TOTAL POSSIBLE # RESULTS : 5222.
 PERCENT OF DATA RECOVERY : 73.61 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 67.29 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 85.31 %
 WINTER (NOV - APR) : 65.02 %

PARAMETER DATA RECOVERY

VOLUME : 91.15 %	CONDUCT : 62.73 %	PH FIELD : 44.77 %
PH LAB : 84.18 %	TOTAL H+ : 79.09 %	SULPHATE : 79.89 %
NITRATE : 79.62 %	CALCIUM : 68.63 %	CHLORIDE : 79.89 %
MAGNESIUM : 68.63 %	POTASSIUM : 68.63 %	SODIUM : 68.36 %
AMMONIUM : 70.78 %	FREE H+ : 84.18 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	6	2.56
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	20	11.98
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	17	4.56
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	25	7.96
NON-STANDARD COLLECTION PERIOD (Z)	2	0.54
NON-STANDARD SAMPLING PERIOD (Y)	3	0.80
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	62	19.56

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	176	5.02
EXCEED GROSS LIMIT (G)	55	1.57
OUTLIER DIXON RATIO (D)	42	1.20
EXCEED (G) AND (D)	7	0.20
UNAFFECTED SAMPLES (NO RESULT CODE)	3224	92.01

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 44.8 %

NETWORK TYPE : DAILY PRECIP
STATION # : 1021 Melbourne
PERIOD OF REPORT : 13 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 311.
SAMPLES WITH FIELD COMMENTS : 153
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 97

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	14	4.5
LEAVES(B)	6	1.9
PARTICULATES(C)	122	39.2
FIBRES(D)	41	13.2
NOT SUBMITTED(E OR X)	12	3.9
MALFUNCTION(F)	4	1.3
SPILL/LEAK(G OR H)	1	0.3
EVENTS MISSED(I)	6	1.9
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	6	1.9
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	1	0.3
AFFECTED (F,I,J,K,L,M,X,E)	15	4.8
UNAFFECTED (NO F,I,J,K,L,M,X,E)	296	95.2

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	299	96.1
SAMPLES WITH VOLUME REPORTED	302	97.1
SAMPLES WITH GDEP AND VOL	290	93.2

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 83.6 %
STANDARD DEVIATION IS 23.7
N IS 255.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 85.0 %
STANDARD DEVIATION IS 20.9 WITH N = 141
WINTER (NOV - APR) : 81.8 %
STANDARD DEVIATION IS 26.7 WITH N = 114

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 1.4 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 23.4 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 77.9 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 311.
 TOTAL # ANALYTICAL RESULTS : 3624.
 TOTAL POSSIBLE # RESULTS : 4354.
 PERCENT OF DATA RECOVERY : 83.23 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 77.63 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 83.47 %
 WINTER (NOV - APR) : 82.99 %

PARAMETER DATA RECOVERY

VOLUME :	97.11 %	CONDUCT :	74.28 %	PH FIELD :	51.45 %
PH LAB :	93.57 %	TOTAL H+ :	91.96 %	SULPHATE :	91.00 %
NITRATE :	91.00 %	CALCIUM :	77.17 %	CHLORIDE :	90.68 %
MAGNESIUM :	77.17 %	POTASSIUM :	77.17 %	SODIUM :	76.85 %
AMMONIUM :	82.32 %	FREE H+ :	93.57 %		

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	4	1.73
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	21	13.21
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	12	3.86
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	12	4.12
NON-STANDARD COLLECTION PERIOD (Z)	7	2.25
NON-STANDARD SAMPLING PERIOD (Y)	2	0.64
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	51	17.59

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	129	3.88
EXCEED GROSS LIMIT (G)	56	1.69
OUTLIER DIXON RATIO (D)	27	0.81
EXCEED (G) AND (D)	3	0.09
UNAFFECTED SAMPLES (NO RESULT CODE)	3107	93.53

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 51.4 %

NETWORK TYPE : DAILY PRECIP
STATION # : 1031 North Easthope
PERIOD OF REPORT : 2 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 429.
SAMPLES WITH FIELD COMMENTS : 295
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 144

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	16	3.7
LEAVES(B)	4	0.9
PARTICULATES(C)	215	50.1
FIBRES(D)	75	17.5
NOT SUBMITTED(E OR X)	56	13.1
MALFUNCTION(F)	11	2.6
SPILL/LEAK(G OR H)	3	0.7
EVENTS MISSED(I)	29	6.8
WET SIDE OPEN(J)	2	0.5
NO PRECIP. COLLECTED(K)	28	6.5
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	3	0.7
AFFECTED (F,I,J,K,L,M,X,E)	66	15.4
UNAFFECTED (NO F,I,J,K,L,M,X,E)	363	84.6

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	388	90.4
SAMPLES WITH VOLUME REPORTED	387	90.2
SAMPLES WITH GDEP AND VOL	353	82.3

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 78.3 %
STANDARD DEVIATION IS 27.2
N IS 283.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 83.0 %
STANDARD DEVIATION IS 23.2 WITH N = 157
WINTER (NOV - APR) : 72.4 %
STANDARD DEVIATION IS 30.6 WITH N = 126

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 3.4 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 36.5 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 66.6 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 429.
 TOTAL # ANALYTICAL RESULTS : 4245.
 TOTAL POSSIBLE # RESULTS : 6006.
 PERCENT OF DATA RECOVERY : 70.68 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 62.02 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 83.15 %
 WINTER (NOV - APR) : 61.84 %

PARAMETER DATA RECOVERY

VOLUME : 90.21 %	CONDUCT : 58.74 %	PH FIELD : 41.03 %
PH LAB : 81.82 %	TOTAL H+ : 78.09 %	SULPHATE : 78.32 %
NITRATE : 78.32 %	CALCIUM : 63.40 %	CHLORIDE : 78.32 %
MAGNESIUM : 63.87 %	POTASSIUM : 63.87 %	SODIUM : 63.87 %
AMMONIUM : 67.83 %	FREE H+ : 81.82 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	16	6.35
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	29	16.76
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	17	3.96
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	24	6.84
NON-STANDARD COLLECTION PERIOD (Z)	3	0.70
NON-STANDARD SAMPLING PERIOD (Y)	2	0.47
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	90	25.50

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	276	7.15
EXCEED GROSS LIMIT (G)	87	2.26
OUTLIER DIXON RATIO (D)	43	1.11
EXCEED (G) AND (D)	18	0.47
UNAFFECTED SAMPLES (NO RESULT CODE)	3434	89.01

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 41.0 %

NETWORK TYPE : DAILY PRECIP
STATION # : 2011 Wellesley
PERIOD OF REPORT : 2 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 393.
SAMPLES WITH FIELD COMMENTS : 184
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 148

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	25	6.4
LEAVES(B)	0	0.0
PARTICULATES(C)	116	29.5
FIBRES(D)	45	11.5
NOT SUBMITTED(E OR X)	22	5.6
MALFUNCTION(F)	11	2.8
SPILL/LEAK(G OR H)	2	0.5
EVENTS MISSED(I)	17	4.3
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	13	3.3
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	5	1.3
AFFECTED (F,I,J,K,L,M,X,E)	31	7.9
UNAFFECTED (NO F,I,J,K,L,M,X,E)	362	92.1

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	386	98.2
SAMPLES WITH VOLUME REPORTED	373	94.9
SAMPLES WITH GDEP AND VOL	366	93.1

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 75.8 %
STANDARD DEVIATION IS 28.5
N IS 317.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 85.6 %
STANDARD DEVIATION IS 21.5 WITH N = 153
WINTER (NOV - APR) : 66.7 %
STANDARD DEVIATION IS 31.2 WITH N = 164

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 3.3 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 35.5 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 67.5 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 393.
 TOTAL # ANALYTICAL RESULTS : 4238.
 TOTAL POSSIBLE # RESULTS : 5502.
 PERCENT OF DATA RECOVERY : 77.03 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 69.76 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 88.26 %
 WINTER (NOV - APR) : 69.07 %

PARAMETER DATA RECOVERY

VOLUME : 94.91 %	CONDUCT : 64.63 %	PH FIELD : 40.20 %
PH LAB : 90.08 %	TOTAL H+ : 84.48 %	SULPHATE : 85.50 %
NITRATE : 85.50 %	CALCIUM : 70.48 %	CHLORIDE : 85.24 %
MAGNESIUM : 70.74 %	POTASSIUM : 70.74 %	SODIUM : 70.74 %
AMMONIUM : 75.06 %	FREE H+ : 90.08 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	13	5.12
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	29	18.35
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	25	6.36
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	27	7.63
NON-STANDARD COLLECTION PERIOD (Z)	2	0.51
NON-STANDARD SAMPLING PERIOD (Y)	1	0.25
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	95	25.96

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	201	5.20
EXCEED GROSS LIMIT (G)	70	1.81
OUTLIER DIXON RATIO (D)	23	0.60
EXCEED (G) AND (D)	3	0.08
UNAFFECTED SAMPLES (NO RESULT CODE)	3568	92.32

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 40.2 %

NETWORK TYPE : DAILY PRECIP
STATION # : 3011 Dorset
PERIOD OF REPORT : 1 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 550.
SAMPLES WITH FIELD COMMENTS : 135
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 204

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	6	1.1
LEAVES(B)	1	0.2
PARTICULATES(C)	18	3.3
FIBRES(D)	0	0.0
NOT SUBMITTED(E OR X)	94	17.1
MALFUNCTION(F)	11	2.0
SPILL/LEAK(G OR H)	6	1.1
EVENTS MISSED(I)	1	0.2
WET SIDE OPEN(J)	7	1.3
NO PRECIP. COLLECTED(K)	25	4.5
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	4	0.7
AFFECTED (F,I,J,K,L,M,X,E)	105	19.1
UNAFFECTED (NO F,I,J,K,L,M,X,E)	445	80.9

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	533	96.9
SAMPLES WITH VOLUME REPORTED	522	94.9
SAMPLES WITH GDEP AND VOL	506	92.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 73.3 %
STANDARD DEVIATION IS 30.7
N IS 437.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 83.4 %
STANDARD DEVIATION IS 25.1 WITH N = 214
WINTER (NOV - APR) : 63.6 %
STANDARD DEVIATION IS 32.5 WITH N = 223

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 3.2 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 35.4 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 66.0 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 550.
 TOTAL # ANALYTICAL RESULTS : 5174.
 TOTAL POSSIBLE # RESULTS : 7700.
 PERCENT OF DATA RECOVERY : 67.19 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 62.73 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 73.96 %
 WINTER (NOV - APR) : 62.07 %

PARAMETER DATA RECOVERY

VOLUME : 94.91 %	CONDUCT : 52.91 %	PH FIELD : 45.45 %
PH LAB : 79.27 %	TOTAL H+ : 76.36 %	SULPHATE : 73.27 %
NITRATE : 73.27 %	CALCIUM : 58.18 %	CHLORIDE : 71.82 %
MAGNESIUM : 58.18 %	POTASSIUM : 58.36 %	SODIUM : 58.36 %
AMMONIUM : 61.09 %	FREE H+ : 79.27 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	17	5.84
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	22	8.87
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	28	5.09
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	22	5.05
NON-STANDARD COLLECTION PERIOD (Z)	15	2.73
NON-STANDARD SAMPLING PERIOD (Y)	4	0.73
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	139	27.47

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	43	0.92
EXCEED GROSS LIMIT (G)	91	1.96
OUTLIER DIXON RATIO (D)	42	0.90
EXCEED (G) AND (D)	7	0.15
UNAFFECTED SAMPLES (NO RESULT CODE)	4469	96.07

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 45.5 %

NETWORK TYPE : DAILY PRECIP
STATION # : 3021 Nithgrove
PERIOD OF REPORT : 1 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 431.
SAMPLES WITH FIELD COMMENTS : 163
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 133

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	7	1.6
LEAVES(B)	7	1.6
PARTICULATES(C)	67	15.5
FIBRES(D)	5	1.2
NOT SUBMITTED(E OR X)	59	13.7
MALFUNCTION(F)	20	4.6
SPILL/LEAK(G OR H)	9	2.1
EVENTS MISSED(I)	7	1.6
WET SIDE OPEN(J)	8	1.9
NO PRECIP. COLLECTED(K)	50	11.6
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	7	1.6
AFFECTED (F,I,J,K,L,M,X,E)	76	17.6
UNAFFECTED (NO F,I,J,K,L,M,X,E)	355	82.4

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	391	90.7
SAMPLES WITH VOLUME REPORTED	372	86.3
SAMPLES WITH GDEP AND VOL	361	83.8

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 75.0 %
STANDARD DEVIATION IS 27.1
N IS 313.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 80.1 %
STANDARD DEVIATION IS 23.2 WITH N = 166
WINTER (NOV - APR) : 69.2 %
STANDARD DEVIATION IS 29.9 WITH N = 147

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 6.4 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 30.7 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 70.6 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 431.
 TOTAL # ANALYTICAL RESULTS : 4406.
 TOTAL POSSIBLE # RESULTS : 6034.
 PERCENT OF DATA RECOVERY : 73.02 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 63.61 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 79.14 %
 WINTER (NOV - APR) : 68.20 %

PARAMETER DATA RECOVERY

VOLUME : 86.31 %	CONDUCT : 63.34 %	PH FIELD : 51.51 %
PH LAB : 83.99 %	TOTAL H+ : 81.44 %	SULPHATE : 79.81 %
NITRATE : 79.81 %	CALCIUM : 66.13 %	CHLORIDE : 79.35 %
MAGNESIUM : 66.13 %	POTASSIUM : 66.36 %	SODIUM : 66.36 %
AMMONIUM : 67.75 %	FREE H+ : 83.99 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	17	6.23
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	17	7.69
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	21	4.87
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	25	6.91
NON-STANDARD COLLECTION PERIOD (Z)	10	2.32
NON-STANDARD SAMPLING PERIOD (Y)	4	0.93
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	81	22.44

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	165	4.09
EXCEED GROSS LIMIT (G)	91	2.26
OUTLIER DIXON RATIO (D)	81	2.01
EXCEED (G) AND (D)	18	0.45
UNAFFECTED SAMPLES (NO RESULT CODE)	3679	91.20

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 51.5 %

NETWORK TYPE : DAILY PRECIP

STATION # : 3031 Balsam Lake

PERIOD OF REPORT : 3 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 419.

SAMPLES WITH FIELD COMMENTS : 93

SAMPLES WITH OFFICE/VALIDATION COMMENTS : 151

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	7	1.7
LEAVES(B)	6	1.4
PARTICULATES(C)	24	5.7
FIBRES(D)	0	0.0
NOT SUBMITTED(E OR X)	34	8.1
MALFUNCTION(F)	18	4.3
SPILL/LEAK(G OR H)	12	2.9
EVENTS MISSED(I)	5	1.2
WET SIDE OPEN(J)	13	3.1
NO PRECIP. COLLECTED(K)	20	4.8
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	2	0.5
AFFECTED (F,I,J,K,L,M,X,E)	47	11.2
UNAFFECTED (NO F,I,J,K,L,M,X,E)	372	88.8

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	417	99.5
SAMPLES WITH VOLUME REPORTED	397	94.7
SAMPLES WITH GDEP AND VOL	395	94.3

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 80.1 %
 STANDARD DEVIATION IS 27.4
 N IS 311.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 85.6 %
 STANDARD DEVIATION IS 22.7 WITH N = 167
 WINTER (NOV - APR) : 73.8 %
 STANDARD DEVIATION IS 30.8 WITH N = 144

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 6.6 %
 PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 33.9 %
 PERCENTAGE OF VALID EFFICIENCIES (50-120) : 67.6 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 419.
 TOTAL # ANALYTICAL RESULTS : 4476.
 TOTAL POSSIBLE # RESULTS : 5866.
 PERCENT OF DATA RECOVERY : 76.30 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 68.80 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 81.46 %
 WINTER (NOV - APR) : 72.11 %

PARAMETER DATA RECOVERY

VOLUME : 94.75 %	CONDUCT : 64.92 %	PH FIELD : 53.22 %
PH LAB : 88.54 %	TOTAL H+ : 85.44 %	SULPHATE : 84.25 %
NITRATE : 84.01 %	CALCIUM : 67.30 %	CHLORIDE : 83.53 %
MAGNESIUM : 67.06 %	POTASSIUM : 67.78 %	SODIUM : 67.78 %
AMMONIUM : 71.12 %	FREE H+ : 88.54 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	11	4.04
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	21	9.42
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	20	4.77
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	27	7.28
NON-STANDARD COLLECTION PERIOD (Z)	8	1.91
NON-STANDARD SAMPLING PERIOD (Y)	3	0.72
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	106	26.84

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	126	3.09
EXCEED GROSS LIMIT (G)	97	2.38
OUTLIER DIXON RATIO (D)	34	0.83
EXCEED (G) AND (D)	18	0.44
UNAFFECTED SAMPLES (NO RESULT CODE)	3804	93.26

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 53.2 %

NETWORK TYPE : DAILY PRECIP
STATION # : 3041 *Raven Lake*
PERIOD OF REPORT : 3 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 450.
SAMPLES WITH FIELD COMMENTS : 76
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 164

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	5	1.1
LEAVES(B)	2	0.4
PARTICULATES(C)	39	8.7
FIBRES(D)	0	0.0
NOT SUBMITTED(E OR X)	24	5.3
MALFUNCTION(F)	4	0.9
SPILL/LEAK(G OR H)	4	0.9
EVENTS MISSED(I)	3	0.7
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	8	1.8
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	1	0.2
AFFECTED (F,I,J,K,L,M,X,E)	26	5.8
UNAFFECTED (NO F,I,J,K,L,M,X,E)	424	94.2

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	447	99.3
SAMPLES WITH VOLUME REPORTED	439	97.6
SAMPLES WITH GDEP AND VOL	436	96.9

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 82.4 %
STANDARD DEVIATION IS 27.4
N IS 356.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 92.1 %
STANDARD DEVIATION IS 20.8 WITH N = 176
WINTER (NOV - APR) : 72.9 %
STANDARD DEVIATION IS 29.6 WITH N = 180

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 0.9 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 32.6 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 69.7 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 450.
 TOTAL # ANALYTICAL RESULTS : 4870.
 TOTAL POSSIBLE # RESULTS : 6300.
 PERCENT OF DATA RECOVERY : 77.30 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 71.08 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 80.54 %
 WINTER (NOV - APR) : 74.54 %

PARAMETER DATA RECOVERY

VOLUME :	97.56 %	CONDUCT :	63.56 %	PH FIELD :	50.67 %
PH LAB :	89.56 %	TOTAL H+ :	87.11 %	SULPHATE :	84.67 %
NITRATE :	84.67 %	CALCIUM :	69.56 %	CHLORIDE :	84.44 %
MAGNESIUM :	69.56 %	POTASSIUM :	69.56 %	SODIUM :	69.33 %
AMMONIUM :	72.44 %	FREE H+ :	89.56 %		

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	18	6.29
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	22	9.73
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	27	6.00
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	32	7.94
NON-STANDARD COLLECTION PERIOD (Z)	2	0.44
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	111	25.46

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	186	4.20
EXCEED GROSS LIMIT (G)	102	2.30
OUTLIER DIXON RATIO (D)	42	0.95
EXCEED (G) AND (D)	8	0.18
UNAFFECTED SAMPLES (NO RESULT CODE)	4093	92.37

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 50.7 %

NETWORK TYPE : DAILY PRECIP
STATION # : 4011 Charleston Lake
PERIOD OF REPORT : 2 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 344.
SAMPLES WITH FIELD COMMENTS : 75
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 136

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	1	0.3
LEAVES(B)	4	1.2
PARTICULATES(C)	25	7.3
FIBRES(D)	11	3.2
NOT SUBMITTED(E OR I)	30	8.7
MAFUNCTION(F)	10	2.9
SPILL/LEAK(G OR H)	7	2.0
EVENTS MISSED(I)	1	0.3
WET SIDE OPEN(J)	1	0.3
NO PRECIP. COLLECTED(K)	0	0.0
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	33	9.6
UNAFFECTED (NO F,I,J,K,L,M,X,E)	311	90.4

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	318	92.4
SAMPLES WITH VOLUME REPORTED	325	94.5
SAMPLES WITH GDEP AND VOL	301	87.5

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 75.2 %
STANDARD DEVIATION IS 27.8
N IS 256.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 77.7 %
STANDARD DEVIATION IS 26.6 WITH N = 133
WINTER (NOV - APR) : 72.5 %
STANDARD DEVIATION IS 28.9 WITH N = 123

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 3.3 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 32.9 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 68.4 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 344.
 TOTAL # ANALYTICAL RESULTS : 3721.
 TOTAL POSSIBLE # RESULTS : 4816.
 PERCENT OF DATA RECOVERY : 77.26 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 73.50 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 78.62 %
 WINTER (NOV - APR) : 76.19 %

PARAMETER DATA RECOVERY

VOLUME : 94.48 %	CONDUCT : 65.12 %	PH FIELD : 36.34 %
PH LAB : 88.08 %	TOTAL H+ : 83.43 %	SULPHATE : 86.34 %
NITRATE : 86.05 %	CALCIUM : 73.26 %	CHLORIDE : 84.88 %
MAGNESIUM : 73.26 %	POTASSIUM : 73.26 %	SODIUM : 73.26 %
AMMONIUM : 75.87 %	FREE H+ : 88.08 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	19	8.48
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	21	17.07
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	18	5.23
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	16	5.28
NON-STANDARD COLLECTION PERIOD (Z)	3	0.87
NON-STANDARD SAMPLING PERIOD (Y)	1	0.29
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	79	26.25

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	63	1.86
EXCEED GROSS LIMIT (G)	33	0.97
OUTLIER DIXON RATIO (D)	35	1.03
EXCEED (G) AND (D)	4	0.12
UNAFFECTED SAMPLES (NO RESULT CODE)	3261	96.02

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 36.3 %

NETWORK TYPE : DAILY PRECIP
STATION # : 4021 Railton
PERIOD OF REPORT : 3 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 233.
SAMPLES WITH FIELD COMMENTS : 51
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 93

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	3	1.3
LEAVES(B)	1	0.4
PARTICULATES(C)	9	3.9
FIBRES(D)	2	0.9
NOT SUBMITTED(E OR X)	25	10.7
MALFUNCTION(F)	13	5.6
SPILL/LEAK(G OR H)	9	3.9
EVENTS MISSED(I)	4	1.7
WET SIDE OPEN(J)	1	0.4
NO PRECIP. COLLECTED(K)	3	1.3
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	1	0.4
AFFECTED (F,I,J,K,L,M,X,E)	28	12.0
UNAFFECTED (NO F,I,J,K,L,M,X,E)	205	88.0

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	220	94.4
SAMPLES WITH VOLUME REPORTED	214	91.8
SAMPLES WITH GDEP AND VOL	201	86.3

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 77.6 %
STANDARD DEVIATION IS 29.5
N IS 168.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 82.0 %
STANDARD DEVIATION IS 27.2 WITH N = 99
WINTER (NOV - APR) : 71.4 %
STANDARD DEVIATION IS 31.8 WITH N = 69

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 5.0 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 32.3 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 71.1 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 233.
 TOTAL # ANALYTICAL RESULTS : 2598.
 TOTAL POSSIBLE # RESULTS : 3262.
 PERCENT OF DATA RECOVERY : 79.64 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 75.84 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 85.34 %
 WINTER (NOV - APR) : 74.19 %

PARAMETER DATA RECOVERY

VOLUME : 91.85 %	CONDUCT : 73.82 %	PH FIELD : 45.06 %
PH LAB : 86.70 %	TOTAL H+ : 80.69 %	SULPHATE : 87.12 %
NITRATE : 87.12 %	CALCIUM : 77.25 %	CHLORIDE : 86.27 %
MAGNESIUM : 77.25 %	POTASSIUM : 77.25 %	SODIUM : 77.25 %
AMMONIUM : 80.69 %	FREE H+ : 86.70 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	7	4.07
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	12	11.43
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	14	6.01
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	15	7.43
NON-STANDARD COLLECTION PERIOD (Z)	11	4.72
NON-STANDARD SAMPLING PERIOD (Y)	4	1.72
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	47	23.38

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	25	1.05
EXCEED GROSS LIMIT (G)	25	1.05
OUTLIER DIXON RATIO (D)	20	0.84
EXCEED (G) AND (D)	2	0.08
UNAFFECTED SAMPLES (NO RESULT CODE)	2312	96.98

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 45.1 %

NETWORK TYPE : DAILY PRECIP
STATION # : 4031 *Graham Lake*
PERIOD OF REPORT : 3 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 356.
SAMPLES WITH FIELD COMMENTS : 118
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 114

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	14	3.9
LEAVES(B)	1	0.3
PARTICULATES(C)	18	5.1
FIBRES(D)	11	3.1
NOT SUBMITTED(E OR X)	65	18.3
MALFUNCTION(F)	36	10.1
SPILL/LEAK(G OR H)	12	3.4
EVENTS MISSED(I)	1	0.3
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	2	0.6
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	5	1.4
AFFECTED (F,I,J,K,L,M,X,E)	70	19.7
UNAFFECTED (NO F,I,J,K,L,M,X,E)	286	80.3

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	352	98.9
SAMPLES WITH VOLUME REPORTED	295	82.9
SAMPLES WITH GDEP AND VOL	292	82.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 79.6 %
STANDARD DEVIATION IS 26.4
N IS 238.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 87.2 %
STANDARD DEVIATION IS 21.1 WITH N = 136
WINTER (NOV - APR) : 69.5 %
STANDARD DEVIATION IS 29.3 WITH N = 102

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 4.8 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 31.5 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 70.5 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 356.
 TOTAL # ANALYTICAL RESULTS : 3415.
 TOTAL POSSIBLE # RESULTS : 4984.
 PERCENT OF DATA RECOVERY : 68.52 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 61.08 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 75.64 %
 WINTER (NOV - APR) : 62.64 %

PARAMETER DATA RECOVERY

VOLUME : 82.87 %	CONDUCT : 58.71 %	PH FIELD : 36.24 %
PH LAB : 78.09 %	TOTAL H+ : 74.44 %	SULPHATE : 75.56 %
NITRATE : 75.28 %	CALCIUM : 64.89 %	CHLORIDE : 75.28 %
MAGNESIUM : 64.61 %	POTASSIUM : 64.61 %	SODIUM : 64.89 %
AMMONIUM : 65.73 %	FREE H+ : 78.09 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS) FREQUENCY % SAMPLES

CONDUCTIVITY DISCREPANCY (C) # CONDUCT	16	7.66
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	32	25.40
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	12	3.37
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	31	11.15
NON-STANDARD COLLECTION PERIOD (Z)	7	1.97
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	57	19.52

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME) FREQUENCY % SAMPLES

UNRELIABLE RESULT (U)	180	5.77
EXCEED GROSS LIMIT (G)	74	2.37
OUTLIER DIXON RATIO (D)	24	0.77
EXCEED (G) AND (D)	12	0.38
UNAFFECTED SAMPLES (NO RESULT CODE)	2830	90.71

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 36.2 %

NETWORK TYPE : DAILY PRECIP
STATION # : 4041 *Whitman Creek*
PERIOD OF REPORT : 3 JAN 1982 TO 29 OCT 1984

TOTAL # OF SAMPLES COLLECTED : 233.
SAMPLES WITH FIELD COMMENTS : 117
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 61

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	19	8.2
LEAVES(B)	2	0.9
PARTICULATES(C)	66	28.3
FIBRES(D)	8	3.4
NOT SUBMITTED(E OR I)	44	18.9
MALFUNCTION(F)	34	14.6
SPILL/LEAK(G OR H)	9	3.9
EVENTS MISSED(I)	6	2.6
WET SIDE OPEN(J)	8	3.4
NO PRECIP. COLLECTED(K)	3	1.3
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	0	0.0
AFFECTED (F,I,J,K,L,M,X,E)	52	22.3
UNAFFECTED (NO F,I,J,K,L,M,X,E)	181	77.7

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	187	80.3
SAMPLES WITH VOLUME REPORTED	190	81.5
SAMPLES WITH GDEP AND VOL	144	61.8

AVERAGE SAMPLING EFFICIENCY (< 120; NO 6, H CODES) 76.1 %
STANDARD DEVIATION IS 25.4
N IS 133.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 79.3 %
STANDARD DEVIATION IS 25.1 WITH N = 91
WINTER (NOV - APR) : 69.1 %
STANDARD DEVIATION IS 25.0 WITH N = 42

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,6,H,I,J,K,M,L OR P) : 5.6 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 22.9 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 77.1 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 233.
 TOTAL # ANALYTICAL RESULTS : 2292.
 TOTAL POSSIBLE # RESULTS : 3262.
 PERCENT OF DATA RECOVERY : 70.26 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 64.38 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 80.48 %
 WINTER (NOV - APR) : 59.42 %

PARAMETER DATA RECOVERY

VOLUME : 81.55 %	CONDUCT : 63.09 %	PH FIELD : 36.48 %
PH LAB : 80.26 %	TOTAL H+ : 76.39 %	SULPHATE : 76.82 %
NITRATE : 76.82 %	CALCIUM : 66.52 %	CHLORIDE : 76.39 %
MAGNESIUM : 66.52 %	POTASSIUM : 66.52 %	SODIUM : 66.52 %
AMMONIUM : 69.53 %	FREE H+ : 80.26 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	8	5.44
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	9	10.84
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	9	3.86
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	12	6.42
NON-STANDARD COLLECTION PERIOD (Z)	1	0.43
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	32	22.22

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	67	3.19
EXCEED GROSS LIMIT (G)	24	1.14
OUTLIER DIXON RATIO (D)	13	0.62
EXCEED (G) AND (D)	1	0.05
UNAFFECTED SAMPLES (NO RESULT CODE)	1997	95.00

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 36.5 %

NETWORK TYPE : DAILY PRECIP

STATION # : 6051 Fernberg

PERIOD OF REPORT : 2 JAN 1982 TO 30 DEC 1984

TOTAL # OF SAMPLES COLLECTED : 231.

SAMPLES WITH FIELD COMMENTS : 167

SAMPLES WITH OFFICE/VALIDATION COMMENTS : 107

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	7	3.0
LEAVES(B)	1	0.4
PARTICULATES(C)	109	47.2
FIBRES(D)	85	36.8
NOT SUBMITTED(E OR X)	13	5.6
MALFUNCTION(F)	3	1.3
SPILL/LEAK(G OR H)	9	3.9
EVENTS MISSED(I)	1	0.4
MET SIDE OPEN(J)	1	0.4
NO PRECIP. COLLECTED(K)	2	0.9
DRY SIDE OPEN(M)	1	0.4
OTHER IN SAMPLE(Q)	9	3.9
AFFECTED (F,I,J,K,L,M,X,E)	17	7.4
UNAFFECTED (NO F,I,J,K,L,M,X,E)	214	92.6

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	227	98.3
SAMPLES WITH VOLUME REPORTED	219	94.8
SAMPLES WITH GDEP AND VOL	215	93.1

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 75.2 %

STANDARD DEVIATION IS 27.5

N IS 191.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 81.1 %

STANDARD DEVIATION IS 23.2 WITH N = 134

WINTER (NOV - APR) : 61.2 %

STANDARD DEVIATION IS 31.7 WITH N = 57

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 6.0 %

PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 28.4 %

PERCENTAGE OF VALID EFFICIENCIES (50-120) : 74.4 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 231.
 TOTAL # ANALYTICAL RESULTS : 2550.
 TOTAL POSSIBLE # RESULTS : 3234.
 PERCENT OF DATA RECOVERY : 78.85 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 74.12 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 82.89 %
 WINTER (NOV - APR) : 71.07 %

PARAMETER DATA RECOVERY

VOLUME : 94.81 %	CONDUCT : 71.00 %	PH FIELD : 0.00 %
PH LAB : 89.61 %	TOTAL H+ : 89.61 %	SULPHATE : 89.18 %
NITRATE : 89.18 %	CALCIUM : 80.52 %	CHLORIDE : 88.74 %
MAGNESIUM : 80.52 %	POTASSIUM : 80.52 %	SODIUM : 80.52 %
AMMONIUM : 80.09 %	FREE H+ : 89.61 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	20	12.20
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	28	12.12
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	42	20.29
NON-STANDARD COLLECTION PERIOD (Z)	2	0.87
NON-STANDARD SAMPLING PERIOD (Y)	2	0.87
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	49	22.79

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	42	1.80
EXCEED GROSS LIMIT (G)	49	2.10
OUTLIER DIXON RATIO (D)	5	0.21
EXCEED (G) AND (D)	3	0.13
UNAFFECTED SAMPLES (NO RESULT CODE)	2232	95.75

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 0.0 %

NETWORK TYPE : DAILY PRECIP
STATION # : 6061 Lac La Croix
PERIOD OF REPORT : 25 FEB 1982 TO 15 MAR 1984

TOTAL # OF SAMPLES COLLECTED : 111.
SAMPLES WITH FIELD COMMENTS : 101
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 60

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	1	0.9
LEAVES(B)	6	5.4
PARTICULATES(C)	68	61.3
FIBRES(D)	66	59.5
NOT SUBMITTED(E OR X)	8	7.2
MALFUNCTION(F)	0	0.0
SPILL/LEAK(G OR H)	5	4.5
EVENTS MISSED(I)	0	0.0
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	1	0.9
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	2	1.8
AFFECTED (F,I,J,K,L,M,X,E)	8	7.2
UNAFFECTED (NO F,I,J,K,L,M,X,E)	103	92.8

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	93	83.8
SAMPLES WITH VOLUME REPORTED	104	93.7
SAMPLES WITH GDEP AND VOL	86	77.5

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 68.8 %
STANDARD DEVIATION IS 28.3
N IS 70.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 80.7 %
STANDARD DEVIATION IS 18.8 WITH N = 42
WINTER (NOV - APR) : 51.0 %
STANDARD DEVIATION IS 31.1 WITH N = 28

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 3.5 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 37.2 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 62.8 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 111.
 TOTAL # ANALYTICAL RESULTS : 1135.
 TOTAL POSSIBLE # RESULTS : 1554.
 PERCENT OF DATA RECOVERY : 73.04 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 69.88 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 85.58 %
 WINTER (NOV - APR) : 61.58 %

PARAMETER DATA RECOVERY

VOLUME : 93.69 %	CONDUCT : 68.47 %	PH FIELD : 0.00 %
PH LAB : 83.78 %	TOTAL H+ : 81.98 %	SULPHATE : 82.88 %
NITRATE : 82.88 %	CALCIUM : 72.07 %	CHLORIDE : 82.88 %
MAGNESIUM : 72.07 %	POTASSIUM : 72.07 %	SODIUM : 71.17 %
AMMONIUM : 74.77 %	FREE H+ : 83.78 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	12	15.79
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	14	12.61
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	17	18.28
NON-STANDARD COLLECTION PERIOD (Z)	12	10.81
NON-STANDARD SAMPLING PERIOD (Y)	7	6.31
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	25	29.07

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	28	2.72
EXCEED GROSS LIMIT (G)	10	0.97
OUTLIER DIXON RATIO (D)	9	0.87
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	984	95.44

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 0.0 %

NETWORK TYPE : DAILY PRECIP
STATION # : 6071 Quetico Centre
PERIOD OF REPORT : 2 JAN 1982 TO 2 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 305.
SAMPLES WITH FIELD COMMENTS : 232
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 136

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	5	1.6
LEAVES(B)	2	0.7
PARTICULATES(C)	134	43.9
FIBRES(D)	86	28.2
NOT SUBMITTED(E OR X)	51	16.7
MALFUNCTION(F)	12	3.9
SPILL/LEAK(G OR H)	4	1.3
EVENTS MISSED(I)	4	1.3
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	40	13.1
DRY SIDE OPEN(M)	0	0.0
OTHER IN SAMPLE(Q)	5	1.6
AFFECTED (F,I,J,K,L,M,X,E)	68	22.3
UNAFFECTED (NO F,I,J,K,L,M,X,E)	237	77.7

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	292	95.7
SAMPLES WITH VOLUME REPORTED	244	80.0
SAMPLES WITH GDEP AND VOL	233	76.4

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 80.7 %
STANDARD DEVIATION IS 25.3
N IS 189.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 86.6 %
STANDARD DEVIATION IS 20.5 WITH N = 150
WINTER (NOV - APR) : 58.1 %
STANDARD DEVIATION IS 29.3 WITH N = 39

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 3.0 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 29.6 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 70.8 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 305.
 TOTAL # ANALYTICAL RESULTS : 2852.
 TOTAL POSSIBLE # RESULTS : 4270.
 PERCENT OF DATA RECOVERY : 66.79 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 62.65 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 74.59 %
 WINTER (NOV - APR) : 53.91 %

PARAMETER DATA RECOVERY

VOLUME : 80.00 %	CONDUCT : 62.62 %	PH FIELD : 0.00 %
PH LAB : 76.07 %	TOTAL H+ : 75.41 %	SULPHATE : 75.08 %
NITRATE : 75.41 %	CALCIUM : 67.54 %	CHLORIDE : 74.75 %
MAGNESIUM : 67.54 %	POTASSIUM : 67.54 %	SODIUM : 67.54 %
AMMONIUM : 69.51 %	FREE H+ : 76.07 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	31	16.23
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	42	13.77
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	59	25.43
NON-STANDARD COLLECTION PERIOD (Z)	16	5.25
NON-STANDARD SAMPLING PERIOD (Y)	5	1.64
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	48	20.60

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	89	3.41
EXCEED GROSS LIMIT (G)	41	1.57
OUTLIER DIXON RATIO (D)	8	0.31
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	2470	94.71

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 0.0 %

NETWORK TYPE : DAILY PRECIP
 STATION # : 6081 Forbes Township
 PERIOD OF REPORT : 2 JAN 1982 TO 30 DEC 1984

TOTAL # OF SAMPLES COLLECTED : 364.
 # SAMPLES WITH FIELD COMMENTS : 265
 # SAMPLES WITH OFFICE/VALIDATION COMMENTS : 128

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	6	1.6
LEAVES(B)	0	0.0
PARTICULATES(C)	126	34.6
FIBRES(D)	95	26.1
NOT SUBMITTED(E OR X)	67	18.4
MALFUNCTION(F)	12	3.3
SPILL/LEAK(G OR H)	5	1.4
EVENTS MISSED(I)	3	0.8
WET SIDE OPEN(J)	9	2.5
NO PRECIP. COLLECTED(K)	29	8.0
DRY SIDE OPEN(M)	1	0.3
OTHER IN SAMPLE(Q)	6	1.6
AFFECTED (F,I,J,K,L,M,X,E)	91	25.0
UNAFFECTED (NO F,I,J,K,L,M,X,E)	273	75.0

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	354	97.3
SAMPLES WITH VOLUME REPORTED	294	80.8
SAMPLES WITH GDEP AND VOL	288	79.1

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 83.2 %
 STANDARD DEVIATION IS 24.3
 N IS 253.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 86.7 %
 STANDARD DEVIATION IS 21.5 WITH N = 199

WINTER (NOV - APR) : 70.4 %
 STANDARD DEVIATION IS 29.6 WITH N = 54

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 6.6 %
 PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 24.0 %
 PERCENTAGE OF VALID EFFICIENCIES (50-120) : 78.1 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 364.
 TOTAL # ANALYTICAL RESULTS : 3175.
 TOTAL POSSIBLE # RESULTS : 5096.
 PERCENT OF DATA RECOVERY : 62.30 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 56.16 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 69.61 %
 WINTER (NOV - APR) : 48.16 %

PARAMETER DATA RECOVERY

VOLUME : 90.77 %	CONDUCT : 56.87 %	PH FIELD : 0.00 %
PH LAB : 73.08 %	TOTAL H+ : 71.70 %	SULPHATE : 70.60 %
NITRATE : 70.60 %	CALCIUM : 60.44 %	CHLORIDE : 70.33 %
MAGNESIUM : 60.44 %	POTASSIUM : 60.99 %	SODIUM : 60.71 %
AMMONIUM : 62.64 %	FREE H+ : 73.08 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	33	15.94
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	41	11.26
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	49	18.42
NON-STANDARD COLLECTION PERIOD (Z)	9	2.47
NON-STANDARD SAMPLING PERIOD (Y)	2	0.55
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	44	15.28

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	86	2.99
EXCEED GROSS LIMIT (G)	55	1.91
OUTLIER DIXON RATIO (D)	14	0.49
EXCEED (G) AND (D)	7	0.24
UNAFFECTED SAMPLES (NO RESULT CODE)	2719	94.38

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 0.0 %

NETWORK TYPE : DAILY PRECIP
STATION # : 6111 Otter Island
PERIOD OF REPORT : 23 JUN 1984 TO 16 NOV 1984

TOTAL # OF SAMPLES COLLECTED : 51.
SAMPLES WITH FIELD COMMENTS : 36
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 15

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
INSECTS(A)	1	2.0
LEAVES(B)	0	0.0
PARTICULATES(C)	30	58.8
FIBRES(D)	3	5.9
NOT SUBMITTED(E OR X)	3	5.9
MALFUNCTION(F)	0	0.0
SPILL/LEAK(G OR H)	1	2.0
EVENTS MISSED(I)	2	3.9
WET SIDE OPEN(J)	0	0.0
NO PRECIP. COLLECTED(K)	1	2.0
DRY SIDE OPEN(M)	2	3.9
OTHER IN SAMPLE(Q)	5	9.8
AFFECTED (F,I,J,K,L,M,X,E)	5	9.8
UNAFFECTED (NO F,I,J,K,L,M,X,E)	46	90.2

SAMPLER EFFICIENCY	FREQUENCY	% SAMPLES
SAMPLES WITH GAUGE DEPTHS	51	100.0
SAMPLES WITH VOLUME REPORTED	50	98.0
SAMPLES WITH GDEP AND VOL	50	98.0

AVERAGE SAMPLING EFFICIENCY (< 120; NO G, H CODES) 97.6 %
STANDARD DEVIATION IS 19.5
N IS 42.0

SEASONAL SAMPLING EFFICIENCY

SUMMER (MAY - OCT) : 97.1 %
STANDARD DEVIATION IS 21.4 WITH N = 32
WINTER (NOV - APR) : 99.0 %
STANDARD DEVIATION IS 11.7 WITH N = 10

PERCENTAGE OF UNRELIABLE EFFICIENCIES (WITH F,G,H,I,J,K,M,L OR P) : 6.0 %
PERCENTAGE OF ABNORMAL EFFICIENCIES (< 50 OR > 120 OR N) : 18.0 %
PERCENTAGE OF VALID EFFICIENCIES (50-120) : 84.0 %

DATA RECOVERY

TOTAL # SAMPLES COLLECTED : 51.
 TOTAL # ANALYTICAL RESULTS : 556.
 TOTAL POSSIBLE # RESULTS : 714.
 PERCENT OF DATA RECOVERY : 77.87 %
 PERCENT OF VALID DATA RECOVERY (NO "U", "G", "D", "B" OR F,I,J,K,L,M) : 74.23 %

SEASONAL DATA RECOVERY

SUMMER (MAY - OCT) : 78.76 %
 WINTER (NOV - APR) : 75.27 %

PARAMETER DATA RECOVERY

VOLUME : 98.04 %	CONDUCT : 80.39 %	PH FIELD : 0.00 %
PH LAB : 92.16 %	TOTAL H+ : 92.16 %	SULPHATE : 88.24 %
NITRATE : 90.20 %	CALCIUM : 70.59 %	CHLORIDE : 90.20 %
MAGNESIUM : 70.59 %	POTASSIUM : 70.59 %	SODIUM : 70.59 %
AMMONIUM : 84.31 %	FREE H+ : 92.16 %	

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
CONDUCTIVITY DISCREPANCY (C) # CONDUCT	2	4.88
LAB AND FIELD PH DISCREPANCY (J) # LAB & FLD PH	0	0.00
ONE OR MORE PARAMETERS HIGH (L)	0	0.00
POOR IONIC BALANCE (M)	4	7.84
POOR CALCULATED VS OBSER PH (H) # OF LAB PH	2	4.26
NON-STANDARD COLLECTION PERIOD (Z)	3	5.88
NON-STANDARD SAMPLING PERIOD (Y)	0	0.00
ABNORMAL SAMPLER EFFICIENCY (N) # OF EFF	8	16.00

RESULT REMARK CODE VALIDATION (EXCLUDE VOLUME)	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	0	0.00
EXCEED GROSS LIMIT (G)	0	0.00
OUTLIER DIXON RATIO (D)	0	0.00
EXCEED (G) AND (D)	0	0.00
UNAFFECTED SAMPLES (NO RESULT CODE)	506	100.00

FIELD PH MEASUREMENTS

PERCENTAGE OF COLLECTED SAMPLES WITH FIELD PH MEASUREMENTS : 0.0 %

APPENDIX 5

STATION : MELBOURNE/DAILY/AEROCHEM

#01

PERIOD : 840315 TO 840618

(800101-841231)

ABSOLUTE % DIFFERENCE $IC1-C21/[(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES						
	N	5TH	25TH	50TH	75TH	90TH	95TH
HT+	2	0.0000	0.0000	0.0067	0.0067	0.0067	0.0067
FW HF+	2	0.0000	0.0000	0.0230	0.0230	0.0230	0.0230
HF+	2	0.0000	0.0000	0.0230	0.0230	0.0230	0.0230
SD4--	2	0.0000	0.0000	0.0069	0.0069	0.0069	0.0069
N-ND3-	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CA++	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CL -	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
MG++	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
K+	2	0.0000	0.0000	0.6122	0.6122	0.6122	0.6122
NA+	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N-NH4+	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STATION : LONGWOODS/DAILY/AEROCHEM

#02

PERIOD : 831205 TO 841105

(800101-841231)

ABSOLUTE % DIFFERENCE $IC1-C21/[(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES						
	N	5TH	25TH	50TH	75TH	90TH	95TH
HT+	9	0.0000	0.0072	0.0094	0.0157	0.0419	0.0419
FW HF+	7	0.0000	0.0000	0.0000	0.0460	0.1608	0.1608
HF+	9	0.0000	0.0000	0.0230	0.0230	0.0460	0.0460
SD4--	9	0.0000	0.0000	0.0000	0.0206	0.0323	0.0323
N-ND3-	9	0.0000	0.0000	0.0000	0.0256	0.0328	0.0328
CA++	9	0.0000	0.0000	0.0225	0.0952	0.1818	0.1818
CL -	9	0.0000	0.0000	0.0241	0.0690	0.1176	0.1176
MG++	8	0.0000	0.0000	0.0000	0.0000	0.6667	0.6667
K+	8	0.0000	0.0000	0.2222	0.4000	0.4000	0.4000
NA+	9	0.0000	0.0000	0.0606	0.1052	0.6667	0.6667
N-NH4+	9	0.0000	0.0000	0.0206	0.0308	0.0545	0.0845

STATION : NORTH EASTHOPE/DAILY/AEROCHEM #03

PERIOD : 840213 TO 841105

(800101-841231)

ABSOLUTE % DIFFERENCE $IC1-C21/[(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES						
	N	5TH	25TH	50TH	75TH	90TH	95TH
HT+	7	0.0000	0.0159	0.0232	0.0364	0.0395	0.0395
FW HF+	6	0.0000	0.0000	0.0000	0.0230	0.0460	0.0460
HF+	7	0.0000	0.0000	0.0000	0.0460	0.0690	0.0690
SD4--	7	0.0000	0.0000	0.0000	0.0241	0.0260	0.0260
N-ND3-	7	0.0000	0.0000	0.0000	0.0000	0.0299	0.0299
CA++	7	0.0000	0.0000	0.0308	0.1818	0.2222	0.2222
CL -	7	0.0000	0.0000	0.0000	0.0741	0.0952	0.0952
MG++	7	0.0000	0.0000	0.0000	0.0000	0.0690	0.0690
K+	7	0.0000	0.1333	0.4000	1.0000	2.0000	2.0000
NA+	7	0.0000	0.0000	0.0000	0.0952	1.0000	1.0000
N-NH4+	7	0.0000	0.0178	0.0426	0.0606	0.0935	0.0935

STATION : WELLESLEY/DAILY/AEROCHEM

#04

PERIOD : 840213 TO 841110

(800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES						
	N	5TH	25TH	50TH	75TH	90TH	95TH
MT+	8	0.0000	0.0106	0.0175	0.0277	0.0599	0.0599
FW HF+	7	0.0000	0.0000	0.0000	0.0920	0.0920	0.0920
HF+	8	0.0000	0.0000	0.0230	0.0460	0.0460	0.0460
SD4--	8	0.0000	0.0000	0.0000	0.0105	0.0127	0.0127
N-ND3-	8	0.0000	0.0000	0.0000	0.0160	0.0741	0.0741
CA++	8	0.0000	0.0000	0.0000	0.1538	0.1905	0.1905
CL -	8	0.0000	0.0351	0.1429	0.2857	0.5000	0.5000
MG++	7	0.0000	0.0000	0.0000	0.0000	0.6667	0.6667
K+	7	0.0000	0.0870	0.6667	2.0000	2.0000	2.0000
NA+	6	0.0000	0.0000	0.1277	0.4000	0.6667	0.6667
N-NH4+	8	0.0000	0.0160	0.0274	0.0480	0.0526	0.0526

STATION : RAVEN LAKE/DAILY/AEROCHEM

#05

PERIOD : 830821 TO 841229

(800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES						
	N	5TH	25TH	50TH	75TH	90TH	95TH
MT+	18	0.0000	0.0171	0.0343	0.0759	0.1061	0.1129
FW HF+	18	0.0000	0.0000	0.0230	0.0230	0.1608	0.2519
HF+	18	0.0000	0.0230	0.0690	0.1379	0.2519	0.4525
SD4--	18	0.0000	0.0000	0.0267	0.0690	0.1887	0.1961
N-ND3-	18	0.0000	0.0000	0.0274	0.0488	0.1818	0.3226
CA++	17	0.0000	0.0465	0.1667	0.3830	0.5455	0.5455
CL -	18	0.0000	0.0000	0.4000	0.8235	1.2000	1.5556
MG++	14	0.0000	0.0000	0.3636	0.6667	0.6667	1.0000
K+	17	0.0000	0.0000	0.2222	1.0000	2.0000	2.0000
NA+	15	0.0000	0.0000	0.3333	0.8235	0.9091	0.9091
N-NH4+	18	0.0000	0.0068	0.0346	0.0703	0.1237	0.3333

STATION : BALSAM LAKE/DAILY/AEROCHEM

#06

PERIOD : 830916 TO 841229

(800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES						
	N	5TH	25TH	50TH	75TH	90TH	95TH
MT+	11	0.0000	0.0118	0.0187	0.0223	0.0242	0.0303
FW HF+	11	0.0000	0.0000	0.0230	0.0460	0.0691	0.0920
HF+	11	0.0000	0.0000	0.0230	0.0460	0.0690	0.0920
SD4--	11	0.0000	0.0000	0.0000	0.0187	0.0235	0.0397
N-ND3-	11	0.0000	0.0000	0.0000	0.0625	0.0690	0.1538
CA++	10	0.0000	0.0000	0.0952	0.1538	0.2857	0.3810
CL -	10	0.0000	0.0000	0.0000	0.1053	0.1176	0.3784
MG++	8	0.0000	0.0000	0.1818	0.6667	0.8000	0.8000
K+	8	0.0000	0.0000	0.0000	0.2857	2.0000	2.0000
NA+	10	0.0000	0.0000	0.2222	0.4167	0.8000	1.1111
N-NH4+	11	0.0000	0.0000	0.0157	0.0357	0.0583	0.1176

STATION : NITHGROVE/DAILY/AEROCHEM #07

PERIOD : 830920 TO 841213 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES						
	N	5TH	25TH	50TH	75TH	90TH	95TH
HT+	12	0.0000	0.0117	0.0189	0.0588	0.0757	0.0858
FW HF+	12	0.0000	0.0230	0.0460	0.1379	0.1608	0.3420
HF+	12	0.0000	0.0230	0.0460	0.0920	0.0920	0.2519
SD4--	12	0.0000	0.0000	0.0000	0.0377	0.0426	0.0426
N-ND3-	12	0.0000	0.0000	0.0000	0.0339	0.0351	0.0488
CA++	12	0.0000	0.1667	0.5000	0.6667	0.7273	1.2000
CL -	12	0.0000	0.0000	0.1333	0.3030	0.4000	0.5882
MG++	9	0.0000	0.2857	0.4615	0.6667	0.6667	0.6667
K+	10	0.0000	0.0000	0.2500	0.9091	1.2000	1.6667
NA+	9	0.0000	0.0000	0.0000	0.3750	1.7778	1.7778
N-NH4+	12	0.0000	0.0000	0.0444	0.0690	0.0727	0.0938

STATION : DORSET/DAILY/AEROCHEM #08

PERIOD : 840213 TO 841213 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES						
	N	5TH	25TH	50TH	75TH	90TH	95TH
HT+	3	0.0000	0.0000	0.0153	0.0331	0.0331	0.0331
FW HF+	3	0.0000	0.0000	0.0230	0.0460	0.0460	0.0460
HF+	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SD4--	3	0.0000	0.0000	0.0262	0.0339	0.0339	0.0339
N-ND3-	3	0.0000	0.0000	0.0000	0.0351	0.0351	0.0351
CA++	3	0.0000	0.0000	0.0000	0.6667	0.6667	0.6667
CL -	3	0.0000	0.0000	0.0000	0.2000	0.2000	0.2000
MG++	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
K+	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NA+	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N-NH4+	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STATION : WHITMAN CREEK/DAILY/AEROCHEM #09

PERIOD : 830731 TO 840707 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES						
	N	5TH	25TH	50TH	75TH	90TH	95TH
HT+	6	0.0000	0.0142	0.0203	0.0299	0.0338	0.0338
FW HF+	4	0.0000	0.0000	0.0000	0.0230	0.0230	0.0230
HF+	6	0.0000	0.0230	0.0460	0.0690	0.0690	0.0690
SD4--	6	0.0000	0.0000	0.0000	0.0105	0.0211	0.0211
N-ND3-	6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CA++	6	0.0000	0.0000	0.0690	0.1176	0.1667	0.1667
CL -	6	0.0000	0.0000	0.0000	0.0800	0.1176	0.1176
MG++	6	0.0000	0.0000	0.0000	0.2222	0.4000	0.4000
K+	6	0.0000	0.1538	0.2222	0.4000	0.4000	0.4000
NA+	4	0.0000	0.0000	0.1333	0.1538	0.1538	0.1538
N-NH4+	6	0.0000	0.0000	0.0177	0.0465	0.0513	0.0513

STATION : RAILTON/DAILY/AEROCHEM #10

PERIOD : 830921 TO 841110 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[(C1+C2)/2]$

PARAMETERS	N	CONCENTRATION PERCENTILES					
		5TH	25TH	50TH	75TH	90TH	95TH
MT+	14	0.0000	0.0134	0.0362	0.1053	0.1775	0.1925
Fw MF+	6	0.0000	0.0000	0.0230	0.0460	0.0460	0.0460
MF+	14	0.0000	0.0230	0.0460	0.0920	0.1837	0.3643
SO4--	13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0127
N-NH3-	13	0.0000	0.0000	0.0000	0.0000	0.0000	0.0488
CA++	13	0.0000	0.0000	0.0541	0.2609	0.2857	0.3333
CL -	12	0.0000	0.0000	0.0000	0.1333	0.2222	0.2857
MG++	12	0.0000	0.0000	0.0870	0.4000	0.6667	2.0000
K+	11	0.0000	0.0952	0.2222	1.6923	2.0000	2.0000
NA+	11	0.0000	0.0000	0.2069	0.2857	0.2857	1.0000
N-NH4+	13	0.0000	0.0293	0.0345	0.0600	0.0971	0.1463

STATION : CHARLESTON LAKE/DAILY/AEROCHEM #11

PERIOD : 830731 TO 840813 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[(C1+C2)/2]$

PARAMETERS	N	CONCENTRATION PERCENTILES					
		5TH	25TH	50TH	75TH	90TH	95TH
MT+	9	0.0000	0.0000	0.0156	0.0278	0.0690	0.0690
Fw MF+	7	0.0000	0.0000	0.0000	0.0230	0.0691	0.0691
MF+	9	0.0000	0.0000	0.0230	0.0460	0.0690	0.0690
SO4--	9	0.0000	0.0000	0.0000	0.0132	0.0444	0.0444
N-NH3-	9	0.0000	0.0000	0.0000	0.0260	0.0952	0.0952
CA++	9	0.0000	0.0000	0.0000	0.2400	0.2857	0.2957
CL -	9	0.0000	0.0000	0.0000	0.0952	0.4000	0.4000
MG++	8	0.0000	0.0000	0.0000	0.2857	0.4000	0.4000
K+	7	0.0000	0.0000	0.2500	2.0000	2.0000	2.0000
NA+	7	0.0000	0.0000	0.0000	0.5000	1.0769	1.0769
N-NH4+	9	0.0000	0.0312	0.0513	0.0833	0.1333	0.1333

STATION : GRAHAM LAKE/DAILY/AEROCHEM #12

PERIOD : 840214 TO 840417 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[(C1+C2)/2]$

PARAMETERS	N	CONCENTRATION PERCENTILES					
		5TH	25TH	50TH	75TH	90TH	95TH
MT+	4	0.0000	0.0000	0.0256	0.0296	0.0296	0.0296
Fw MF+	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
MF+	4	0.0000	0.0460	0.0690	0.0690	0.0690	0.0690
SO4--	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N-NH3-	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CA++	4	0.0000	0.1333	0.2857	0.2857	0.2857	0.2857
CL -	4	0.0000	0.0000	0.0000	0.0168	0.0168	0.0168
MG++	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
K+	3	0.0000	0.0000	0.0000	0.9091	0.9091	0.9091
NA+	4	0.0000	0.0000	0.1818	0.2857	0.2857	0.2857
N-NH4+	4	0.0000	0.0901	0.1379	0.2400	0.2400	0.2400

STATION : FORBES TNSP/DAILY/AEROCHEM #13
 PERIOD : 831119 TO 841017 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)/2]$

PARAMETERS	N	5TH	25TH	50TH	75TH	90TH	95TH
MT+	12	0.0000	0.0113	0.0168	0.0441	0.0516	0.0727
F _h HF+	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HF+	12	0.0000	0.0000	0.0691	0.0920	0.1150	0.1150
SD4--	12	0.0000	0.0000	0.0000	0.0165	0.0408	0.0645
N-ND3-	11	0.0000	0.0000	0.0000	0.0211	0.0513	0.0870
CA++	12	0.0000	0.0480	0.1818	0.3333	0.3333	1.0000
CL -	12	0.0000	0.0000	0.0000	0.1053	0.1818	0.2222
MG++	11	0.0000	0.0000	0.0000	0.4000	0.4000	0.4000
K+	9	0.0000	0.0000	0.4000	0.9091	2.0000	2.0000
NA+	10	0.0000	0.0000	0.1176	2.0000	2.0000	2.0000
N-NH4+	11	0.0000	0.0000	0.0267	0.0385	0.1176	0.5714

STATION : QUETICO CENTRE/DAILY/AEROCHEM #14
 PERIOD : 840627 TO 841128 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)/2]$

PARAMETERS	N	5TH	25TH	50TH	75TH	90TH	95TH
MT+	6	0.0000	0.0000	0.0227	0.0233	0.0465	0.0465
F _h HF+	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HF+	6	0.0000	0.0000	0.0460	0.0460	0.0460	0.0460
SD4--	6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N-ND3-	6	0.0000	0.0000	0.0000	0.0000	0.1053	0.1053
CA++	6	0.0000	0.0000	0.1622	0.2857	0.3158	0.3158
CL -	6	0.0000	0.0000	0.2857	0.3333	1.4286	1.4286
MG++	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
K+	4	0.0000	0.0000	0.0000	0.2222	0.2222	0.2222
NA+	3	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000
N-NH4+	6	0.0000	0.0000	0.0769	0.1053	0.1818	0.1818

STATION : LAC LA CROIX/DAILY/AEROCHEM #15
 PERIOD : 831119 TO 831122 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)/2]$

PARAMETERS	N	5TH	25TH	50TH	75TH	90TH	95TH
MT+	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
F _h HF+	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
HF+	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SD4--	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N-ND3-	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CA++	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CL -	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
MG++	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
K+	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NA+	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N-NH4+	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STATION : FERNBERG/DAILY/AEROCHEM

#16

PERIOD : 840712 TO 841216

(800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[(C1+C2)/2]$

PARAMETERS	N	5TH	25TH	50TH	75TH	90TH	95TH
MT+	3	0.0000	0.0000	0.0350	0.1065	0.1065	0.1065
FW MF+	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
MF+	4	0.0000	0.0000	0.0000	0.0230	0.0230	0.0230
SD4--	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N-NO3-	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CA++	4	0.0000	0.0645	0.1053	0.6667	0.6667	0.6667
CL -	4	0.0000	0.0000	0.2857	0.3333	0.3333	0.3333
MG++	3	0.0000	0.0000	0.0000	0.1538	0.1538	0.1538
K+	3	0.0000	0.0000	0.6667	0.9091	0.9091	0.9091
NA+	4	0.0000	0.0000	0.2222	0.4000	0.4000	0.4000
N-NH4+	4	0.0000	0.0488	0.0513	0.1333	0.1333	0.1333

STATION : OTTER ISLAND/DAILY/AEROCHEM

#17

PERIOD : 840626 TO 840718

(800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[(C1+C2)/2]$

PARAMETERS	N	5TH	25TH	50TH	75TH	90TH	95TH
MT+	3	0.0000	0.0000	0.0060	0.0070	0.0070	0.0070
FW MF+	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
MF+	3	0.0000	0.0000	0.0000	0.0460	0.0460	0.0460
SD4--	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
N-NO3-	3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CA++	3	0.0000	0.0000	0.2609	0.2857	0.2857	0.2857
CL -	3	0.0000	0.0000	0.0000	0.1333	0.1333	0.1333
MG++	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
K+	2	0.0000	0.0000	1.6923	1.6923	1.6923	1.6923
NA+	2	0.0000	0.0000	0.1538	0.1538	0.1538	0.1538
N-NH4+	3	0.0000	0.0000	0.1053	0.1176	0.1176	0.1176

APPENDIX 6

***** EVENT COLOCATED SAMPLE *****

STATION : LONGWOODS/DAILY/AEROCHEM #02
PERIOD : 801124 TO 841229 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)]/2$

PARAMETERS	CONCENTRATION PERCENTILES					DEPOSITION PERCENTILES				
	N	25TH	50TH	75TH	90TH	N	25TH	50TH	75TH	90TH
MT+	227	0.0180	0.0449	0.0945	0.2636	227	0.0259	0.0605	0.1537	0.5108
FW MF+	112	0.0230	0.0460	0.1150	0.3196	112	0.0230	0.0567	0.1443	0.3887
HF+	239	0.0230	0.0691	0.1608	0.4086	239	0.0332	0.0826	0.2395	0.6036
SD4--	238	0.0104	0.0333	0.0800	0.2136	238	0.0181	0.0479	0.1334	0.3833
N-ND3-	236	0.0120	0.0328	0.0690	0.1682	236	0.0221	0.0483	0.1245	0.3560
CA++	200	0.0625	0.1538	0.3158	0.5263	200	0.0703	0.1636	0.3607	0.5845
CL -	240	0.0364	0.1071	0.2295	0.4561	240	0.0487	0.1330	0.2642	0.5455
MG++	203	0.0000	0.1538	0.2857	0.5934	203	0.0439	0.1562	0.3658	0.6777
K+	204	0.0952	0.2963	0.5714	1.0000	204	0.0961	0.3261	0.5918	0.9928
NA+	205	0.0541	0.2222	0.5000	0.7826	205	0.0871	0.2322	0.5081	0.8565
N-NH4+	213	0.0189	0.0548	0.1235	0.3182	213	0.0279	0.0667	0.1705	0.4666
G-DEPTH	261	0.0000	0.0000	0.0000	0.0000					
S-DEPTH	274	0.0113	0.0338	0.0870	0.2667					

STATION : DORSET/DAILY/AEROCHEM #08
PERIOD : 810804 TO 841229 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)]/2$

PARAMETERS	CONCENTRATION PERCENTILES					DEPOSITION PERCENTILES				
	N	25TH	50TH	75TH	90TH	N	25TH	50TH	75TH	90TH
MT+	361	0.0195	0.0457	0.0938	0.1950	361	0.0350	0.0744	0.1675	0.3684
FW MF+	207	0.0230	0.0460	0.0920	0.1608	207	0.0252	0.0482	0.1104	0.2171
HF+	366	0.0230	0.0690	0.1279	0.2971	366	0.0417	0.0973	0.1927	0.4059
SD4--	347	0.0124	0.0408	0.0984	0.1875	347	0.0269	0.0634	0.1462	0.2706
N-ND3-	342	0.0000	0.0392	0.0952	0.2500	342	0.0263	0.0679	0.1516	0.3077
CA++	266	0.0364	0.1333	0.3077	0.7200	266	0.0539	0.1338	0.3364	0.7410
CL -	334	0.0444	0.1333	0.2941	0.5714	334	0.0513	0.1559	0.3244	0.6087
MG++	255	0.0000	0.0952	0.4242	1.2000	255	0.0324	0.1184	0.4242	1.1452
K+	257	0.0800	0.4000	0.8387	1.5556	257	0.1035	0.4009	0.7945	1.5608
NA+	261	0.0260	0.2000	0.5556	1.0000	261	0.0604	0.2052	0.5455	1.0769
N-NH4+	261	0.0215	0.0645	0.1513	0.4000	281	0.0347	0.0844	0.1792	0.4087
G-DEPTH	391	0.0000	0.0000	0.0000	0.0364					
S-DEPTH	387	0.0162	0.0421	0.0934	0.2400					

***** EVENT COLOCATED SAMPLE *****

STATION : RAILTON/DAILY/AEROCHEM #10
PERIOD : 830921 TO 841229 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES					DEPOSITION PERCENTILES				
	N	25TH	50TH	75TH	90TH	N	25TH	50TH	75TH	90TH
MT+	66	0.0336	0.0856	0.2156	0.5514	66	0.0652	0.1990	0.4588	0.8136
FW HF+	29	0.0460	0.0920	0.2292	0.4960	29	0.0520	0.1473	0.4662	0.7190
HF+	66	0.0690	0.1379	0.2746	0.7845	66	0.0840	0.2250	0.5309	1.0713
SD4--	65	0.0211	0.0606	0.2439	0.3429	65	0.0554	0.1941	0.4188	0.8517
N-NO3-	65	0.0339	0.1069	0.2373	0.4000	65	0.0868	0.2249	0.4216	0.9176
CA++	59	0.1176	0.2941	0.6667	1.0794	59	0.1180	0.3319	0.6533	1.3530
CL -	64	0.0690	0.1538	0.4324	0.9091	64	0.1049	0.3588	0.7191	1.0785
MG++	54	0.0000	0.3704	0.6667	0.8571	54	0.1112	0.4320	0.7977	1.2240
K+	53	0.1818	0.5000	1.2941	2.0000	53	0.2332	0.6544	1.4422	2.0000
NA+	51	0.0000	0.2500	1.0000	1.5556	51	0.0612	0.3574	1.1680	1.6967
N-NH4+	65	0.0241	0.1714	0.3704	0.6190	65	0.0573	0.2498	0.6134	1.0680
G-DEPTH	66	0.0000	0.0000	0.0278	0.0480					
S-DEPTH	69	0.0234	0.1138	0.3434	0.7718					

STATION : CHARLESTON LAKE/DAILY/AEROCHEM #11
PERIOD : 810511 TO 810721 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/[C(C1+C2)/2]$

PARAMETERS	CONCENTRATION PERCENTILES					DEPOSITION PERCENTILES				
	N	25TH	50TH	75TH	90TH	N	25TH	50TH	75TH	90TH
MT+	12	0.0187	0.0342	0.1477	0.2237	12	0.0423	0.0905	0.2183	0.2305
FW HF+	11	0.0230	0.0460	0.0460	0.0920	11	0.0435	0.0584	0.1197	0.1223
HF+	26	0.0460	0.0691	0.1608	0.2519	26	0.0505	0.1197	0.1852	0.2676
SD4--	24	0.0083	0.0408	0.0606	0.1474	24	0.0333	0.0764	0.1172	0.2278
N-NO3-	24	0.0060	0.0504	0.1333	0.2105	24	0.0359	0.0933	0.1725	0.2405
CA++	21	0.0526	0.1333	0.3030	0.4762	21	0.0917	0.2160	0.3415	0.4816
CL -	25	0.0000	0.0541	0.1622	0.3000	25	0.0258	0.0811	0.2308	0.3296
MG++	21	0.0000	0.0000	0.2222	0.4516	21	0.0158	0.0712	0.2096	0.4084
K+	21	0.0000	0.0000	0.2857	1.0000	21	0.0213	0.0967	0.3570	0.9258
NA+	21	0.0571	0.1667	0.6667	0.6667	21	0.0657	0.1561	0.5872	0.7513
N-NH4+	22	0.0211	0.0651	0.2500	0.4561	22	0.0420	0.1038	0.2851	0.3718
G-DEPTH	26	0.0000	0.0000	0.0000	0.0000					
S-DEPTH	27	0.0158	0.0635	0.0967	0.2222					

***** EVENT COLOCATED SAMPLE *****

STATION : FORBES TWSP/DAILY/AEROCHEM #13

PERIOD : 830930 TO 841228 (800101-841231)

ABSOLUTE % DIFFERENCE $|C1-C2|/((C1+C2)/2)$

PARAMETERS	CONCENTRATION PERCENTILES					DEPOSITION PERCENTILES				
	N	25TH	50TH	75TH	90TH	N	25TH	50TH	75TH	90TH
HT+	96	0.0244	0.0513	0.0893	0.1642	96	0.0364	0.0766	0.1753	0.4164
F _h MF+	0	0.0000	0.0000	0.0000	0.0000	0	0.0000	0.0000	0.0000	0.0000
MF+	92	0.0460	0.1150	0.2292	0.4743	92	0.0568	0.1317	0.3064	0.6850
SD4--	91	0.0000	0.0339	0.0870	0.1818	91	0.0341	0.0792	0.2222	0.3576
N-NO3-	85	0.0000	0.0274	0.0800	0.1818	85	0.0271	0.0722	0.1726	0.3401
CA++	71	0.0000	0.1111	0.2857	1.0000	71	0.0432	0.1328	0.3292	1.0780
CL -	84	0.0000	0.1818	0.3636	1.0000	84	0.0667	0.1818	0.4688	1.0111
MG++	66	0.0000	0.0606	0.4000	0.6667	66	0.0213	0.1312	0.4127	0.6787
K+	66	0.0000	0.1818	0.9091	2.0000	66	0.0272	0.2197	0.9188	2.0000
NA+	70	0.0426	0.1818	1.0000	2.0000	70	0.0805	0.2587	1.0159	2.0000
N-NH4+	73	0.0062	0.0465	0.1250	0.6667	73	0.0249	0.0766	0.2526	0.7021
G-DEPTH	99	0.0000	0.0000	0.0222	0.0606					
S-DEPTH	92	0.0148	0.0352	0.0915	0.2600					

APPENDIX 7

*** ACIDITY - TOTAL FIXED ENDPOINT (TFE) ***

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	01/05/79
LIS Test Name Code:	ACDT	Units	: mg/L as CaCO ₃
Work Station Code	: PHACD	Unit Code	: 064915
Method Code	: 001BT2	Supervisor	: M. Rawlings

Sample Type/Matrix : Precipitation, Throughfall, Stemflow, Domestic Waters, Industrial Wastes, Sewage, Rivers, Lakes

SAMPLING:

Quantity Required: 15 mL
Container : Polystyrene

ANALYTICAL PROCEDURE:

Sample aliquots (10.0 mL) are titrated in an automated system with 0.01N sodium hydroxide to a pH endpoint of 8.3. The titrant is standardized by titrating 0.005N potassium hydrogen phthalate to the pH endpoint of 8.3. The titrant delivery rate is determined from the slope of the titration curve and the stability of the pH readings following each aliquot of titrant. N.B. pH and Gran acidity are determined simultaneously

INSTRUMENTATION:

Automated modular titration system with microcomputer control and data reduction software.

REPORTING:

Maximum Significant Figures: 3
Minimum Increment (M) : 0.01 Detection Criterion (T): 0.2

CALIBRATION:

2 standard buffers covering the pH range of 4 to 7.

CONTROLS:

Calibration : LTBL plus two standards, eg, QCA

MODIFICATIONS:

01/04/82- Sample volume was decreased from 100.0 to 10.0 mL.
01/05/83- System was fully automated by introduction of a sampler, and an automated device for washing the electrode between analyses.

NOTES:

Due to the instability of the QC standards at these concentration levels, calibration control limits are based on measured averages rather than theoretical concentrations.

ACIDITY - TOTAL FIXED ENDPOINT

QUALITY CONTROL DATA FROM 01/01/82 TO 16/12/82

LAB: Precipitation

Analytical Range: 0.20 to 100.0 mg/L as CaCO₃

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	180	25.00	24.90	-0.10	0.491
B :	180	10.00	10.70	0.70	0.347
A+B :	179	35.00	35.59	0.59	0.745
A-B :	179	15.00	14.20	-0.80	0.413

s.d(AB): Sw(within run): 0.292 S(between runs): 0.425 S/Sw: 1.45

On any given day the calibration is accepted if the values obtained lie within the ranges:

33.79 to 37.39 for A+B
13.00 to 15.40 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
41	0.00 - 2.00	0.122	12.21
43	2.00 - 5.00	0.224	6.40
25	5.00 - 10.00	0.175	2.33
6	10.00 - 25.0	0.58	3.29
13	25.0 - 100.0	0.99	1.58
128	Overall	0.45	N/A

DETECTION CRITERION: 0.20

OTHER CHECKS:

	<u>Number of Data</u>	<u>Data Mean</u>	<u>Standard Deviation</u>
Long Term Blank :	121	0.82	0.212

ACIDITY - TOTAL FIXED ENDPOINT

QUALITY CONTROL DATA FROM 05/01/83 TO 22/12/83

LAB: Precipitation

Analytical Range: 0.21 to 100.0 mg/L as CaCO_3

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	145	25.00	25.12	0.12	0.675
B :	145	10.00	10.41	0.41	0.368
A+B :	144	35.00	35.53	0.53	0.889
A-B :	144	15.00	14.72	-0.28	0.612

s.d(AB): Sw(within run): 0.433 S(between runs): 0.543 S/Sw: 1.26

On any given day the calibration is accepted if the values obtained lie within the ranges:

33.73 to 37.33 for A+B
13.51 to 15.91 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
5	0.00 - 2.00	0.130	12.95
12	2.00 - 5.00	0.187	5.33
8	5.00 - 10.00	0.136	1.82
2	10.00 - 25.0	0.21	1.21
1	25.0 - 100.0	N/A	N/A
28	Overall	0.15	N/A

DETECTION CRITERION: 0.21

OTHER CHECKS:

	<u>Number of Data</u>	<u>Data Mean</u>	<u>Standard Deviation</u>
Long Term Blank :	73	0.87	0.180

ACIDITY - TOTAL FIXED ENDPOINT

QUALITY CONTROL DATA FROM 03/01/84 TO 21/12/84

LAB: Precipitation

Analytical Range: 0.18 to 100.0 mg/L as CaCO₃

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	158	25.00	24.98	-0.02	0.393
B :	158	10.00	10.15	0.15	0.364
A+B :	157	35.00	35.13	0.13	0.714
A-B :	157	15.00	14.83	-0.17	0.255

s.d(AB): Sw(within run): 0.180 S(between runs): 0.379 S/Sw: 2.10

On any given day the calibration is accepted if the values obtained lie within the ranges:

33.33 to 36.93 for A+B
13.64 to 16.04 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
45	0.00 - 2.00	0.110	10.97
93	2.00 - 5.00	0.113	3.22
33	5.00 - 10.00	0.114	1.53
9	10.00 - 25.0	1.25	7.12
3	25.0 - 100.0	0.17	0.28
183	Overall	0.35	N/A

DETECTION CRITERION: 0.18

OTHER CHECKS:

	<u>Number of Data</u>	<u>Data Mean</u>	<u>Standard Deviation</u>
Long Term Blank :	155	0.82	0.240

*** CALCIUM ***

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	18/05/79
LIS Test Name Code:	CAUR	Units	: mg/L as Ca
Work Station Code	: PRAA	Unit Code	: 064820
Method Code	: 002CA1	Supervisor	: M. Rawlings
Sample Type/Matrix: Precipitation, Throughfall, Stemflow.			

SAMPLING:

Quantity Required: 25 mL
Container : Polystyrene

ANALYTICAL PROCEDURE:

Samples are analysed by AAS at 422.7 nm with an air-acetylene flame. Acidified lanthanum chloride is added as a releasing agent via an automated sampling train.

Approximate absorbance: 0.2 at the 2.00 mg/L level.

INSTRUMENTATION:

Automated modular continuous flow atomic absorption spectrophotometer (AAS) system

REPORTING:

Maximum Significant Figures: 3	
Minimum Increment (W) : 0.01	Detection Criterion (T): 0.04

CALIBRATION:

BL plus 6 standards

CONTROLS:

Calibration : 2 standards, eg, QCA
Drift : BL plus 2 standards every 10 samples

CALCIUM

QUALITY CONTROL DATA FROM 01/01/82 TO 22/12/82

LAB: Precipitation

Analytical Range: 0.04 to 2.00 mg/L as Ca

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	91	1.20	1.21	0.01	0.024
B :	91	0.20	0.20	-0.00	0.020
A+B :	90	1.40	1.41	0.01	0.034
A-B :	90	1.00	1.01	0.01	0.029

s.d(AB): Sw(within run): 0.021 S(between runs): 0.022 S/Sw: 1.07

On any given day the calibration is accepted if the values obtained lie within the ranges:

1.31 to 1.49 for A+B
0.94 to 1.06 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
62	0.00 - 0.40	0.023	11.75
16	0.40 - 1.00	0.035	4.98
11	1.00 - 2.00	0.029	1.94
89	Overall	0.027	N/A

DETECTION CRITERION: 0.04

CALCIUM

QUALITY CONTROL DATA FROM 06/01/83 TO 21/12/83

LAB: Precipitation

Analytical Range: 0.02 to 2.00 mg/L as Ca

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	46	1.20	1.23	0.03	0.034
B :	46	0.20	0.21	0.01	0.015
A+B :	46	1.40	1.44	0.04	0.038
A-B :	46	1.00	1.03	0.03	0.036

s.d(AB): Sw(within run): 0.026 S(between runs): 0.026 S/Sw: 1.02

On any given day the calibration is accepted if the values obtained lie within the ranges:

1.31 to 1.49 for A+B
0.94 to 1.06 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
11	0.00 - 0.40	0.013	6.50
3	0.40 - 1.00	0.046	6.55
2	1.00 - 2.00	0.007	0.47
16	Overall	0.026	N/A

DETECTION CRITERION: 0.02

CALCIUM

QUALITY CONTROL DATA FROM 03/01/84 TO 05/12/84

LAB: Precipitation

Analytical Range: 0.02 to 2.00 mg/L as Ca

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	53	1.20	1.22	0.02	0.022
B :	53	0.20	0.20	-0.00	0.014
A+B :	53	1.40	1.42	0.02	0.027
A-B :	53	1.00	1.03	0.03	0.025

s.d(AB): Sw(within run): 0.018 S(between runs): 0.018 S/Sw: 1.04

On any given day the calibration is accepted if the values obtained lie within the ranges:

1.31 to 1.49 for A+B
0.94 to 1.06 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
67	0.00 - 0.40	0.011	5.39
12	0.40 - 1.00	0.028	3.97
13	1.00 - 2.00	0.021	1.38
92	Overall	0.017	N/A

DETECTION CRITERION: 0.02

*** CHLORIDE ***

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	01/04/78
LIS Test Name Code:	CLIDUR	Units	: mg/L as Cl
Work Station Code	: PRIC1	Unit Code	: 064817
Method Code	: 005A10	Supervisor	: M. Rawlings
Sample Type/Matrix: Precipitation, Throughfall, Stemflow			

SAMPLING:

Quantity Required: 15 mL
Container : Polystyrene

ANALYTICAL PROCEDURE:

Chloride is separated from other anions in the sample by automated suppressed ion chromatography using an eluent mixture of 0.003M sodium bicarbonate and 0.0024M sodium carbonate with conductivity detection. Samples are spiked with Na₂CO₃/NaHCO₃ to match the eluent strength and maintain background conductivity. The concentration of chloride in mg/L as Cl is determined by comparison of the sample scan to a series of standard scans.

Full scale conductivity : 10 uS/cm.

Nitrate and sulphate are determined simultaneously.

INSTRUMENTATION:

Basic modular continuous flow ion chromatographic system plus microcomputer for automated sample introduction and timing.

REPORTING:

Maximum Significant Figures: 3

Minimum Increment (W) : 0.01

Detection Criterion (T): 0.03

CALIBRATION:

BL plus 6 standards

CONTROLS:

Calibration : 2 standards, eg, QCA

Drift : 1 standard every 10 samples

MODIFICATIONS:

20/09/84 - Chloride range was changed from 1.50 mg/L full scale to 2.00 mg/L full scale.

CHLORIDE

QUALITY CONTROL DATA FROM 06/01/82 TO 24/12/82

LAB: Precipitation

Analytical Range: 0.03 to 1.50 mg/L as Cl

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	248	1.20	1.19	-0.01	0.025
B :	247	0.30	0.30	0.00	0.014
A+B :	246	1.50	1.50	-0.00	0.031
A-B :	246	0.90	0.89	-0.01	0.025

s.d(AB): Sw(within run): 0.018 S(between runs): 0.020 S/Sw: 1.13

On any given day the calibration is accepted if the values obtained lie within the ranges:

1.43 to 1.57 for A+B
0.86 to 0.95 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
191	0.00 - 0.30	0.020	13.18
71	0.30 - 0.75	0.021	4.02
24	0.75 - 1.50	0.019	1.70
286	Overall	0.020	N/A

DETECTION CRITERION: 0.03

CHLORIDE

QUALITY CONTROL DATA FROM 04/01/83 TO 20/12/83

LAB: Precipitation

Analytical Range: 0.03 to 1.50 mg/L as Cl

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	297	1.20	1.21	0.01	0.020
B :	295	0.30	0.30	0.00	0.010
A+B :	293	1.50	1.51	0.01	0.019
A-B :	293	0.90	0.91	0.01	0.024

s.d(AB): Sw(within run): 0.017

S(between runs): 0.015

S/Sw: 0.91

On any given day the calibration is accepted if the values obtained lie within the ranges:

1.43 to 1.57 for A+B
0.86 to 0.95 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
185	0.00 - 0.30	0.019	12.51
58	0.30 - 0.75	0.025	4.70
8	0.75 - 1.50	0.066	5.85
251	Overall	0.023	N/A

DETECTION CRITERION: 0.03

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CHLORIDE

QUALITY CONTROL DATA FROM 09/01/84 TO 20/12/84

LAB: Precipitation

Analytical Range: 0.03 to 1.50 mg/L as Cl

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	170	1.20	1.21	0.01	0.029
B :	170	0.30	0.30	0.00	0.012
A+B :	169	1.50	1.52	0.02	0.032
A-B :	169	0.90	0.91	0.01	0.029

s.d(AB): Sw(within run): 0.020 S(between runs): 0.022 S/Sw: 1.08

On any given day the calibration is accepted if the values obtained lie within the ranges:

1.43 to 1.57 for A+B
0.86 to 0.95 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
204	0.00 - 0.30	0.021	13.91
75	0.30 - 0.75	0.018	3.52
18	0.75 - 1.50	0.033	2.94
297	Overall	0.022	N/A

DETECTION CRITERION: 0.03

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	01/04/78
LIS Test Name Code:	CLIDUR	Units	: ug/Filter as Cl
Work Station Code	: PRLOV	Unit Code	: 361817
Method Code	: 004AIC	Supervisor	: M. Rawlings
Sample Type/Matrix: W40 filters from LoVol filter packs.			

SAMPLING:

Quantity Required: 1 filter
 Container : Polyethylene bag

SAMPLE PREPARATION:

Filters are extracted with 50.0 mL of DDW in polyethylene tubes with ultrasonic treatment followed by a 24 hour rest period.

ANALYTICAL PROCEDURE:

Chloride is separated from other anions in the sample by automated suppressed ion chromatography using an eluent mixture of 0.003M sodium bicarbonate and 0.0024M sodium carbonate with conductivity detection. Samples are spiked with Na₂CO₃/NaHCO₃ to match the eluent strength and maintain background conductivity. The concentration of chloride in mg/L as Cl is determined by comparison of the sample scan to a series of standard scans. Results are converted to ug/filter as Cl.
 Full scale conductivity : 30 uS/cm.
 Nitrate and sulphate are determined simultaneously.

INSTRUMENTATION:

Ultrasonic bath; polyethylene tubes
 Basic modular continuous flow ion chromatographic system plus microcomputer for automated sample introduction and timing.

REPORTING:

Maximum Significant Figures: 3
 Minimum Increment(W): 0.50 ug/filter Detection Criterion(T): 0.7 ug/filter

CALIBRATION:

BL plus 6 standards

CONTROLS:

Calibration : 2 standards, eg, QCA
 Drift : 1 standard every 10 samples

MODIFICATIONS:

01/08/81 - Ion chromatographic procedure for precipitation samples was modified for analysis of LoVol W40 filter extracts by developing the above filter extraction procedures.
 10/03/84 - Microcomputer for automated sampling and timing was introduced. At that time automated spiking of samples with Na₂CO₃/NaHCO₃ was introduced.
 20/09/84 - Chloride range was changed from 1.50 mg/L full scale to 2.00 mg/L full scale. Quality control standards were not changed.

NOTES:

Detection criterion is based on duplicate analyses of the extract from one filter because duplicate filters are not received.

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CHLORIDE

QUALITY CONTROL DATA FROM 03/04/84 TO 18/12/84

LAB: Precipitation

Analytical Range: 0.7 to 75.0 ug/filter as Cl

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	22	60.0	60.1	0.1	0.87
B :	22	15.0	15.5	0.5	0.63
A+B :	22	75.0	75.6	0.6	1.03
A-B :	22	45.0	44.6	-0.4	1.11

s.d(AB): Sw(within run): 0.79 S(between runs): 0.76 S/Sw: 0.96

On any given day the calibration is accepted if the values obtained lie within the ranges:

71.6 to 78.4 for A+B
42.8 to 47.3 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
6	0.0 - 15.0	0.41	5.44
1	15.0 - 37.5	N/A	N/A
0	37.5 - 75.0	N/A	N/A
7	Overall	0.39	N/A

DETECTION CRITERION: 0.7

*** CONDUCTIVITY ***

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	01/04/78
LIS Test Name Code:	COND25	Units	: uS/cm at 25 C
Work Station Code	: PRICI	Unit Code	: 350351
Method Code	: 002A12	Supervisor	: M Rawlings
Sample Type/Matrix: Precipitation, Throughfall, Stemflow			

SAMPLING:

Quantity Required: 25 mL
Container : Polystyrene

ANALYTICAL PROCEDURE:

After equilibration at 25 C, the conductivity of the sample is measured.

INSTRUMENTATION:

Automated modular continuous flow conductivity system comprised of sampler, water bath, conductivity meter with cell, chart recorder.

REPORTING:

Maximum Significant Figures: 3
Minimum Increment (W) : 0.1 Detection Criterion (T): 0.4

CALIBRATION:

Compatibility between conductivity meter and chart recorder is confirmed by checking 3 standard resistances

CONTROLS:

Calibration: LTBL plus 2 standards, eg, QCA
Drift : 1 solution every 10 samples

MODIFICATIONS:

18/10/83 -Automated continuous flow system was introduced.

NOTES:

A calibration standard for the ion chromatographic system is utilized as a drift control for the conductivity system, but its theoretical conductivity is unknown.

CONDUCTIVITY

QUALITY CONTROL DATA FROM 05/01/82 TO 06/12/82

LAB: Precipitation

Analytical Range: 0.4 to 250 uS/cm

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	102	73.9	74.5	0.6	1.30
B :	102	14.9	17.3	2.3	1.09
A+B :	101	88.8	91.9	3.0	1.73
A-B :	101	59.0	57.3	-1.6	1.54

s.d(AB): Sw(within run): 1.09

S(between runs): 1.20

S/Sw: 1.10

On any given day the calibration is accepted if the values obtained lie within the ranges:

79.8 to 97.8 for A+B
53.0 to 65.0 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
78	0.0 - 20.0	0.22	2.21
60	20.0 - 50.0	0.43	1.23
9	50.0 - 100.0	0.67	0.90
5	100.0 - 250	0.4	0.26
152	Overall	0.4	N/A

DETECTION CRITERION: 0.4

OTHER CHECKS:

	<u>Number of Data</u>	<u>Data Mean</u>	<u>Standard Deviation</u>
STD Resistance :	102	1586.6	5.91

CONDUCTIVITY

QUALITY CONTROL DATA FROM 04/01/83 TO 23/09/83

LAB: Precipitation

Analytical Range: 0.2 to 250 uS/cm

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	65	73.9	74.4	0.5	0.84
B :	65	14.9	16.7	1.8	0.72
A+B :	65	88.8	91.1	2.2	0.83
A-B :	65	59.0	57.6	-1.3	1.32

s.d(AB): Sw(within run): 0.94

S(between runs): 0.78

S/Sw: 0.84

On any given day the calibration is accepted if the values obtained lie within the ranges:

79.8 to 97.8 for A+B
53.0 to 65.0 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
34	0.0 - 20.0	0.13	1.32
25	20.0 - 50.0	0.23	0.65
5	50.0 - 100.0	0.42	0.56
2	100.0 - 250	0.7	0.40
66	Overall	0.2	N/A

DETECTION CRITERION: 0.2

OTHER CHECKS:

	<u>Number of Data</u>	<u>Data Mean</u>	<u>Standard Deviation</u>
STD Resistance :	65	1584.2	4.96

CONDUCTIVITY

QUALITY CONTROL DATA FROM 03/02/84 TO 20/12/84

LAB: Precipitation

Analytical Range: 0.4 to 100 uS/cm

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	66	44.5	46.0	1.5	2.26
B :	72	7.5	9.4	1.9	0.98
A+B :	66	52.0	55.5	3.5	2.88
A-B :	66	37.0	36.4	-0.6	1.94

s.d(AB): Sw(within run): 1.37

S(between runs): 1.74

S/Sw: 1.27

On any given day the calibration is accepted if the values obtained lie within the ranges:

43.0 to 61.0 for A+B

31.0 to 43.0 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
25	0.0 - 10.0	0.22	4.36
46	10.0 - 20.0	0.79	5.27
82	20.0 - 50.0	1.28	3.65
14	50.0 - 100	0.6	0.85
167	Overall	1.0	N/A

DETECTION CRITERION: 0.4

*** MAGNESIUM ***

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	18/05/79
LIS Test Name Code:	MGUR	Units	: mg/L as Mg
Work Station Code	: PRAA	Unit Code	: 064812
Method Code	: 001CA1	Supervisor	: M. Rawlings
Sample Type/Matrix: Precipitation, Throughfall, Stemflow.			

SAMPLING:

Quantity Required: 25 mL
Container : Polystyrene

ANALYTICAL PROCEDURE:

Samples are analysed by AAS at 285.2 nm with an air-acetylene flame. Acidified lanthanum chloride is added as a releasing agent via an automated sampling train.

Approximate absorbance: 0.5 at the 0.50 mg/L level.

INSTRUMENTATION:

Automated modular continuous flow atomic absorption spectrophotometer (AAS) system

REPORTING:

Maximum Significant Figures: 3
Minimum Increment (W) : 0.005

Detection Criterion (T): 0.008

CALIBRATION:

BL plus 6 standards

CONTROLS:

Calibration : 2 standards, eg, QCA
Drift : BL plus 2 standards every 10 samples

MAGNESIUM

QUALITY CONTROL DATA FROM 05/01/82 TO 22/12/82

LAB: Precipitation

Analytical Range: 0.007 to 0.500 mg/L as Mg

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	86	0.300	0.292	-0.008	0.0050
B :	86	0.050	0.046	-0.004	0.0045
A+B :	86	0.350	0.338	-0.012	0.0066
A-B :	86	0.250	0.245	-0.005	0.0068

s.d(AB): Sw(within run): 0.0048 S(between runs): 0.0048 S/Sw: 0.99

On any given day the calibration is accepted if the values obtained lie within the ranges:

0.328 to 0.373 for A+B
0.235 to 0.265 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
54	0.000 - 0.100	0.0043	8.65
25	0.100 - 0.250	0.0113	6.44
11	0.250 - 0.500	0.0078	2.09
90	Overall	0.0077	N/A

DETECTION CRITERION: 0.007

MAGNESIUM

QUALITY CONTROL DATA FROM 06/01/83 TO 21/12/83

LAB: Precipitation

Analytical Range: 0.008 to 0.500 mg/L as Mg

CALIBRATION CONTROL:

	Number of Data	Expected Concn	Av. Concn Measured	Av. Bias	Standard Deviation
A :	44	0.300	0.296	-0.004	0.0076
B :	44	0.050	0.049	-0.001	0.0037
A+B :	44	0.350	0.345	-0.005	0.0093
A-B :	44	0.250	0.247	-0.003	0.0075

s.d(AB): Sw(within run): 0.0053

S(between runs): 0.0060

S/Sw: 1.13

On any given day the calibration is accepted if the values obtained lie within the ranges:

0.328 to 0.373 for A+B
0.235 to 0.265 for A-B

DUPLICATES:

Number of Data Pairs	Sample Concn Span	Mean s.d.	Relative s.d. (%)
12	0.000 - 0.100	0.0050	9.96
1	0.100 - 0.250	N/A	N/A
3	0.250 - 0.500	0.0029	0.77
16	Overall	0.0046	N/A

DETECTION CRITERION: 0.008

MAGNESIUM

QUALITY CONTROL DATA FROM 03/01/84 TO 09/12/84

LAB: Precipitation

Analytical Range: 0.007 to 0.500 mg/L as Mg

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	56	0.300	0.298	-0.002	0.0054
B :	56	0.050	0.049	-0.001	0.0044
A+B :	56	0.350	0.348	-0.003	0.0074
A-B :	56	0.250	0.249	-0.001	0.0064

s.d(AB): Sw(within run): 0.0046 S(between runs): 0.0049 S/Sw: 1.08

On any given day the calibration is accepted if the values obtained lie within the ranges:

0.328 to 0.373 for A+B
0.235 to 0.265 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
77	0.000 - 0.100	0.0045	9.02
15	0.100 - 0.250	0.0042	2.38
9	0.250 - 0.500	0.0093	2.47
101	Overall	0.0052	N/A

DETECTION CRITERION: 0.007

*** NITROGEN - AMMONIA PLUS AMMONIUM ***

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	01/05/84
LIS Test Name Code:	NNHTFR, NNHTUR	Units	: mg/L as N
Work Station Code	: PRNUT	Unit Code	: 064807
Method Code	: 103CC2	Supervisor	: M. Rawlings
Sample Type/Matrix: Precipitation, Throughfall, Stemflow			

SAMPLING:

Quantity Required: 15 mL
Container : Polystyrene

ANALYTICAL PROCEDURE:

Ammonia plus ammonium ions are determined on the supernatant of a settled sample via the formation of indophenol blue in a buffered system using nitroprusside as a catalyst. A reference stream, which differs from the colour formation stream by replacement of the catalyst with an equal flow of water, is employed to suppress sample matrix effects.

Approximate absorbance : 1.1 at 5.00 mg/L as N level.

INSTRUMENTATION:

Basic automated modular continuous flow system plus the following modules: 2 of 37 C heating bath (7.7 mL delay). Colourimetric measurement is through a 1.5 cm light path at 630 nm.

REPORTING:

Maximum Significant Figures: 3	
Minimum Increment (W) : 0.005	Detection Criterion (T): 0.01

CALIBRATION:

BL plus 4 standards

CONTROLS:

Calibration : LTBK plus 3 standards, eg, QCA
Drift : BL plus 3 standards

MODIFICATIONS:

01/05/84- The procedure introduced on this date is the same as Method A for nitrogen-ammonia in HAMES except that the samples are not filtered and the full scale concentration is 5.00 mg/L as N.

NITROGEN - AMMONIA PLUS AMMONIUM

QUALITY CONTROL DATA FROM 14/05/84 TO 20/12/84

LAB: Precipitation

Analytical Range: 0.006 to 5.000 mg/L as N

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	50	4.000	4.003	0.003	0.0157
B :	50	0.800	0.802	0.002	0.0100
A+B :	50	4.800	4.805	0.005	0.0182
A-B :	50	3.200	3.201	0.001	0.0189
C :	50	0.800	0.801	0.001	0.0042
D :	50	0.200	0.193	-0.007	0.0090
C+D :	50	1.000	0.994	-0.006	0.0101
C-D :	50	0.600	0.607	0.007	0.0098

s.d(AB): Sw(within run): 0.0134 S(between runs): 0.0131 S/Sw: 0.98
s.d(CD): Sw(within run): 0.0069 S(between runs): 0.0070 S/Sw: 1.02

On any given day the calibration is accepted if the values obtained lie within the ranges:

4.575 to 5.025 for A+B
3.050 to 3.350 for A-B
0.955 to 1.045 for C+D
0.570 to 0.630 for C-D

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
23	0.000 - 0.100	0.0034	6.89
62	0.100 - 0.500	0.0076	2.54
30	0.500 - 1.000	0.0124	1.66
9	1.000 - 2.000	0.0251	1.67
1	2.000 - 5.000	N/A	N/A
125	Overall	0.0121	N/A

DETECTION CRITERION: 0.006

OTHER CHECKS:

	<u>Number of Data</u>	<u>Data Mean</u>	<u>Standard Deviation</u>
Std Cal :	49	1	0.1

*** NITROGEN - NITRATE ***

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	01/04/78
LIS Test Name Code:	NND3UR	Units	: mg/L as N
Work Station Code	: PRIC1	Unit Code	: 064807
Method Code	: 003A10	Supervisor	: M. Rawlings
Sample Type/Matrix: Precipitation, Throughfall, Stemflow.			

SAMPLING:

Quantity Required: 15 mL
Container : Polystyrene

ANALYTICAL PROCEDURE:

Nitrate is separated from other anions in the sample by automated suppressed ion chromatography using an eluent mixture of 0.003M sodium bicarbonate and 0.0024M sodium carbonate with conductivity detection. Samples are spiked with Na₂CO₃/NaHCO₃ to match the eluent strength and maintain background conductivity. The concentration of nitrate in mg/L as N is determined by comparison of the sample scan to a series of standard scans.

Full scale conductivity : 10 uS/cm.

Sulphate and chloride are determined simultaneously.

INSTRUMENTATION:

Basic modular continuous flow ion chromatographic system plus microcomputer for automated sample introduction and timing.

REPORTING:

Maximum Significant Figures: 3

Minimum Increment (W) : 0.01

Detection Criterion (T): 0.02

CALIBRATION:

BL plus 6 standards

CONTROLS:

Calibration : 2 standards, eg, QCA

Drift : 1 standard every 10 samples.

NITROGEN - NITRATE

QUALITY CONTROL DATA FROM 06/01/82 TO 24/12/82

LAB: Precipitation

Analytical Range: 0.02 to 2.00 mg/L as N

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	251	1.60	1.60	-0.00	0.017
B :	251	0.40	0.40	-0.00	0.009
A+B :	250	2.00	2.00	-0.00	0.020
A-B :	250	1.20	1.20	0.00	0.019

s.d(AB): Sw(within run): 0.014 S(between runs): 0.014 S/Sw: 1.01

On any given day the calibration is accepted if the values obtained lie within the ranges:

1.91 to 2.09 for A+B
1.14 to 1.26 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
151	0.00 - 0.40	0.010	4.85
118	0.40 - 1.00	0.019	2.75
20	1.00 - 2.00	0.016	1.09
289	Overall	0.016	N/A

DETECTION CRITERION: 0.02

NITROGEN - NITRATE

QUALITY CONTROL DATA FROM 04/01/83 TO 22/12/83

LAB: Precipitation

Analytical Range: 0.02 to 2.00 mg/L as N

CALIBRATION CONTROL:

		<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A	:	321	1.60	1.60	-0.00	0.020
B	:	320	0.40	0.39	-0.01	0.012
A+B	:	319	2.00	1.99	-0.01	0.020
A-B	:	319	1.20	1.21	0.01	0.026

s.d(AB): Sw(within run): 0.018

S(between runs): 0.016

S/Sw: 0.89

On any given day the calibration is accepted if the values obtained lie within the ranges:

1.91 to 2.09 for A+B

1.14 to 1.26 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
137	0.00 - 0.40	0.014	6.98
110	0.40 - 1.00	0.013	1.90
24	1.00 - 2.00	0.081	5.38
271	Overall	0.028	N/A

DETECTION CRITERION: 0.02

NITROGEN - NITRATE

QUALITY CONTROL DATA FROM 09/01/84 TO 20/12/84

LAB: Precipitation

Analytical Range: 0.03 to 2.00 mg/L as N

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	168	1.60	1.61	0.01	0.022
B :	168	0.40	0.39	-0.01	0.017
A+B :	167	2.00	2.00	-0.00	0.027
A-B :	167	1.20	1.21	0.01	0.028

s.d(AB): Sw(within run): 0.020 S(between runs): 0.019 S/Sw: 0.97

On any given day the calibration is accepted if the values obtained lie within the ranges:

1.91 to 2.09 for A+B
1.14 to 1.26 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
137	0.00 - 0.40	0.016	7.89
121	0.40 - 1.00	0.022	3.10
43	1.00 - 2.00	0.038	2.56
301	Overall	0.023	N/A

DETECTION CRITERION: 0.03

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	01/07/80
LIS Test Name Code:	NN03FR NNRICF	Units	: ug/Filter as N
Work Station Code	: PRSEQ	Unit Code	: 361807
Method Code	: 004A10	Supervisor	: M. Rawlings

Sample Type/Matrix: Teflon and nylon filters from sequential filter packs and nylon filters from LoVol filter packs.

SAMPLING

Quantity Required: 1 filter
Container : Polyethylene bags

SAMPLE PREPARATION:

Filters are extracted with 25.0 mL of DDW (Teflon) or 25.0 mL of 0.03N NaOH (nylon) in polystyrene tubes with ultrasonic treatment followed by a 24 hour rest period.

ANALYTICAL PROCEDURE:

Nitrate is separated from other anions in the sample extract by automated suppressed ion chromatography using an eluent mixture of 0.003M sodium bicarbonate and 0.0024M sodium carbonate with conductivity detection. Samples are spiked with $\text{Na}_2\text{CO}_3/\text{NaHCO}_3$ to match the eluent strength and maintain background conductivity. The concentration of nitrate in $\mu\text{g/L}$ as N is determined by comparison of the sample scan to a series of standard scans. Results are converted to $\mu\text{g/filter as N}$.
Full scale conductivity : 30 $\mu\text{S/cm}$.
Sulphate and chloride are determined simultaneously.

INSTRUMENTATION:

- Ultrasonic bath; polystyrene tubes
- Basic modular continuous flow ion chromatographic system plus microcomputer for automated sample introduction and timing.

REPORTING:

Maximum Significant Figures: 3
Minimum Increment (M) : 0.25 $\mu\text{g/filter}$ Detection Criterion (T): 0.5 $\mu\text{g/filter}$

CALIBRATION:

BL plus 6 standards

CONTROLS:

Calibration : 2 standards, eg, QCA
Drift : 1 standard every 10 samples.

MODIFICATIONS:

01/07/80 - Ion chromatographic procedure for precipitation samples was modified for analysis of Teflon and nylon filter extracts by developing the above filter extraction procedure.

10/03/84 - Microcomputer for automated sampling and timing was introduced. At that time automated spiking of samples with $\text{Na}_2\text{CO}_3/\text{NaHCO}_3$ was introduced.

NOTES:

Detection criterion is based on duplicate analyses of the extract from one filter because duplicate filters are not received.

NITROGEN - NITRATE

QUALITY CONTROL DATA FROM 06/01/82 TO 03/12/82

LAB: Precipitation

Analytical Range: 0.48 to 50.0 ug/filter as N

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	152	40.0	40.0	0.0	0.75
B :	153	10.0	10.3	0.3	0.29
A+B :	151	50.0	50.3	0.3	0.89
A-B :	151	30.0	29.8	-0.2	0.72

s.d(AB): Sw(within run): 0.51 S(between runs): 0.57 S/Sw: 1.13

On any given day the calibration is accepted if the values obtained lie within the ranges:

47.8 to 52.3 for A+B
28.5 to 31.5 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
58	0.00 - 10.00	0.293	5.85
10	10.00 - 25.0	0.34	1.93
3	25.0 - 50.0	0.38	1.02
71	Overall	0.32	N/A

DETECTION CRITERION: 0.48

NITROGEN - NITRATE

QUALITY CONTROL DATA FROM 03/01/84 TO 27/12/84

LAB: Precipitation

Analytical Range: 0.52 to 50.0 ug/filter as N

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	137	40.0	39.9	-0.1	0.53
B :	138	10.0	10.1	0.1	0.30
A+B :	136	50.0	50.0	0.0	0.65
A-B :	136	30.0	29.9	-0.1	0.57

s.d(AB): Sw(within run): 0.40 S(between runs): 0.43 S/Sw: 1.07

On any given day the calibration is accepted if the values obtained lie within the ranges:

47.8 to 52.3 for A+B
28.5 to 31.5 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
119	0.00 - 10.00	0.319	6.38
19	10.00 - 25.0	0.60	3.42
9	25.0 - 50.0	0.63	1.69
147	Overall	0.43	N/A

DETECTION CRITERION: 0.52

*** NITROGEN - NITRATE ***

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	01/07/80
LIS Test Name Code:	NN03UR	Units	: ug/Filter as N
Work Station Code	: PRLDV	Unit Code	: 361807
Method Code	: 004A1C	Supervisor	: M. Rawlings
Sample Type/Matrix: W40 filters from LoVol filter packs.			

SAMPLING:

Quantity Required: 1 filter
Container : Polyethylene bag

SAMPLE PREPARATION:

Filters are extracted with 50.0 mL of DDW in polyethylene tubes with ultrasonic treatment followed by a 24 hour rest period.

ANALYTICAL PROCEDURE:

Nitrate is separated from other anions in the sample extract by automated suppressed ion chromatography using an eluent mixture of 0.003M sodium bicarbonate and 0.0024M sodium carbonate with conductivity detection. Samples are spiked with $\text{Na}_2\text{CO}_3/\text{NaHCO}_3$ to match the eluent strength and maintain background conductivity. The concentration of nitrate in mg/L as N is determined by comparison of the sample scan to a series of standard scans. Results are converted to ug/filter as N.
Full scale conductivity : 30 uS/cm
N.B. Sulphate and chloride are determined simultaneously.

INSTRUMENTATION:

- Ultrasonic bath; polyethylene tubes
- Basic modular continuous flow ion chromatographic system plus microcomputer for automated sample introduction and timing.

REPORTING:

Maximum Significant Figures: 3
Minimum Increment (W) : 0.5 ug/filter Detection Criterion (T): 1 ug/filter

CALIBRATION:

BL plus 6 standards

CONTROLS:

Calibration : 2 standards, eg, QCA
Drift : 1 standard every 10 samples

MODIFICATIONS:

01/08/81 - Ion chromatographic procedure for precipitation samples was modified for analysis of LoVol W40 filter extracts by developing the above filter extraction procedure.

10/03/84 - Microcomputer for automated sampling and timing was introduced. At that time automated spiking of samples with $\text{Na}_2\text{CO}_3/\text{NaHCO}_3$ was introduced.

NOTES:

Detection criterion is based on duplicate analyses of the extract from one filter because duplicate filters are not received.

NITROGEN - NITRATE

QUALITY CONTROL DATA FROM 06/01/82 TO 03/12/82

LAB: Precipitation

Analytical Range: 0.96 to 100.0 ug/filter as N

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	152	80.0	80.1	0.1	1.50
B :	153	20.0	20.5	0.5	0.58
A+B :	151	100.0	100.6	0.6	1.78
A-B :	151	60.0	59.5	-0.5	1.43

s.d(AB): Sw(within run): 1.01 S(between runs): 1.14 S/Sw: 1.13

On any given day the calibration is accepted if the values obtained lie within the ranges:

95.5 to 104.5 for A+B
57.0 to 63.0 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
58	0.00 - 20.00	0.585	5.85
10	20.00 - 50.0	0.68	1.93
3	50.0 - 100.0	0.76	1.02
71	Overall	0.64	N/A

DETECTION CRITERION: 0.96

NITROGEN - NITRATE

QUALITY CONTROL DATA FROM 07/01/83 TO 27/12/83

LAB: Precipitation

Analytical Range: 2.43 to 100.0 ug/filter as N

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	77	80.0	79.5	-0.5	1.63
B :	77	20.0	20.4	0.4	0.77
A+B :	77	100.0	99.9	-0.1	2.14
A-B :	77	60.0	59.2	-0.8	1.39

s.d(AB): Sw(within run): 0.98

S(between runs): 1.28

S/Sw: 1.30

On any given day the calibration is accepted if the values obtained lie within the ranges:

95.5 to 104.5 for A+B

57.0 to 63.0 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
25	0.00 - 20.00	1.479	14.79
7	20.00 - 50.0	3.37	9.63
2	50.0 - 100.0	2.12	2.83
34	Overall	2.07	N/A

DETECTION CRITERION: 2.43

NITROGEN - NITRATE

QUALITY CONTROL DATA FROM 03/01/84 TO 27/12/84

LAB: Precipitation

Analytical Range: 1.05 to 100.0 ug/filter as N

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	137	80.0	79.9	-0.1	1.07
B :	138	20.0	20.1	0.1	0.59
A+B :	136	100.0	100.0	0.0	1.30
A-B :	136	60.0	59.8	-0.2	1.14

s.d(AB): Sw(within run): 0.81

S(between runs): 0.86

S/Sw: 1.07

On any given day the calibration is accepted if the values obtained lie within the ranges:

95.5 to 104.5 for A+B
57.0 to 63.0 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
119	0.00 - 20.00	0.638	6.38
19	20.00 - 50.0	1.20	3.42
9	50.0 - 100.0	1.27	1.69
147	Overall	0.85	N/A

DETECTION CRITERION: 1.05

*** NITROGEN-TOTAL KJELDAHL ***

IDENTIFICATION:

Laboratory	: Rivers and Lakes	Method Introduced:	01/04/79
LIS Test Name Code:	NNTKUR	Units	: mg/L as N
Work Station Code	: RTNF	Unit Code	: 064807
Method Code	: 004AC2	Supervisor	: J. Crowther
Sample Type/Matrix: Rivers, Lakes, Precipitation, Soil Extracts, Effluents.			

SAMPLING:

Quantity Required: 50 mL
Container : Glass or plastic (polystyrene)

ANALYTICAL PROCEDURE:

Samples are digested in a sulphuric acid-mercuric oxide-potassium sulphate media using two block digesters kept at 200 C and 360 C. The pH of the digestate is adjusted in-line in two stages and then ammonia is determined by formation of indophenol blue in a buffered system using nitroprusside as a catalyst.
Approximate absorbance : 0.5 at the 2.0 mg/L as N level.
N.B. Total phosphorus is determined simultaneously.

INSTRUMENTATION:

- Block digesters(2)
- Basic automated modular continuous flow system plus 1 module:37 C bath(7.7 mL delay). Colourimetric measurement is through a 5.0 cm. light path at 630 nm.
- Data capture, reduction, and processing via a multi-stage microcomputer system

REPORTING:

Maximum Significant Figures: 3	
Minimum Increment (W) : 0.01	Detection Criterion (T): 0.04

CALIBRATION:

BL plus 4 undigested standards

CONTROLS:

Calibration	: LTBL plus 2 undigested standards, eg. QCA
Recovery	: 3 digested BL plus 3 digested standards in duplicate, eg, R1
Drift	: BL plus 1 undigested standard

MODIFICATIONS:

15/08/83 - Microcomputer system was introduced. At this time the calibration technique was changed from linear interpolation to the use of a quadratic.

NOTES:

System is calibrated with undigested standards, but sample concentrations are adjusted to reflect day's value for digested blank.

NITROGEN - TOTAL KJELDAHL

QUALITY CONTROL DATA FROM 05/01/82 TO 23/12/82

LAB: Rivers and Lakes

Analytical Range: 0.04 to 2.00 mg/L as N

CALIBRATION CONTROL:

	Number of Data	Expected Concn	Av. Concn Measured	Av. Bias	Standard Deviation
A :	154	1.500	1.499	-0.001	0.0121
B :	154	0.500	0.497	-0.003	0.0065
A+B :	153	2.000	1.996	-0.004	0.0152
A-B :	153	1.000	1.002	0.002	0.0123

s.d(AB): Sw(within run): 0.0087 S(between runs): 0.0097 S/Sw: 1.12

On any given day the calibration is accepted if the values obtained lie within the ranges:

1.910 to 2.090 for A+B
0.940 to 1.060 for A-B

RECOVERIES:

	Number of Data	Expected Concn	Av. Concn Measured	Standard Deviation
R1 :	292	1.40	1.41	0.023
R2 :	299	0.84	0.84	0.021
R3 :	304	0.28	0.28	0.013

DUPLICATES:

Number of Data Pairs	Sample Concn Span	Mean s.d.	Relative s.d. (%)
341	0.00 - 0.40	0.021	10.71
131	0.40 - 1.00	0.019	2.67
20	1.00 - 2.00	0.034	2.27
492	Overall	0.021	N/A

DETECTION CRITERION: 0.04

OTHER CHECKS:

	Number of Data	Data Mean	Standard Deviation
Long Term Blank :	151	0.005	0.0050
Digested Blank :	254	0.021	0.0163
Standard Cal :	153	282.7	43.27

NITROGEN - TOTAL KJELDAHL

QUALITY CONTROL DATA FROM 05/01/83 TO 05/12/83

LAB: Rivers and Lakes

Analytical Range: 0.05 to 2.00 mg/L as N

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	143	1.500	1.503	0.003	0.0118
B :	143	0.500	0.503	0.003	0.0114
A+B :	142	2.000	2.006	0.006	0.0197
A-B :	142	1.000	0.999	-0.001	0.0122

s.d(AB): Sw(within run): 0.0087 S(between runs): 0.0116 S/Sw: 1.34

On any given day the calibration is accepted if the values obtained lie within the ranges:

1.910 to 2.090 for A+B
0.940 to 1.060 for A-B

RECOVERIES:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Standard Deviation</u>
R1 :	267	1.40	1.36	0.047
R2 :	268	0.84	0.82	0.035
R3 :	267	0.28	0.28	0.019

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
188	0.00 - 0.40	0.032	15.99
105	0.40 - 1.00	0.032	4.50
11	1.00 - 2.00	0.044	2.96
304	Overall	0.033	N/A

DETECTION CRITERION: 0.05

OTHER CHECKS:

	<u>Number of Data</u>	<u>Data Mean</u>	<u>Standard Deviation</u>
Long Term Blank :	145	0.007	0.0072
Digested Blank :	364	0.019	0.0138
Standard Cal :	72	347	36.1

NITROGEN - TOTAL KJELDAHL

QUALITY CONTROL DATA FROM 03/01/84 TO 31/12/84

LAB: Rivers and Lakes

Analytical Range: 0.03 to 2.00 mg/L as N

CALIBRATION CONTROL:

	Number of Data	Expected Concn	Av. Concn Measured	Av. Bias	Standard Deviation
A :	155	1.500	1.494	-0.006	0.0108
B :	155	0.500	0.507	0.007	0.0149
A+B :	154	2.000	2.000	0.000	0.0206
A-B :	154	1.000	0.987	-0.013	0.0159

s.d(AB): Sw(within run): 0.0113 S(between runs): 0.0130 S/Sw: 1.16

On any given day the calibration is accepted if the values obtained lie within the ranges:

1.910 to 2.090 for A+B
0.940 to 1.060 for A-B

RECOVERIES:

	Number of Data	Expected Concn	Av. Concn Measured	Standard Deviation
R1 :	307	1.40	1.38	0.041
R2 :	307	0.84	0.83	0.027
R3 :	310	0.28	0.28	0.031

DUPLICATES:

Number of Data Pairs	Sample Concn Span	Mean s.d.	Relative s.d. (%)
188	0.00 - 0.40	0.021	10.33
110	0.40 - 1.00	0.035	4.93
28	1.00 - 2.00	0.036	2.41
326	Overall	0.028	N/A

DETECTION CRITERION: 0.03

OTHER CHECKS:

	Number of Data	Data Mean	Standard Deviation
Long Term Blank :	155	0.011	0.0036
Digested Blank :	155	0.018	0.0101
Standard Cal :	57	419	34.4

888 PH 888

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	01/05/79
LIS Test Name Code:	PH	Units	: Dimensionless
Work Station Code	: PHACD	Unit Code	: Nil
Method Code	: 002A11	Supervisor	: M. Rawlings
Sample Type/Matrix: Precipitation, Throughfall, Stemflow			

SAMPLING:

Quantity Required: 15 mL
Container : Polystyrene

ANALYTICAL PROCEDURE:

pH is directly measured on a stirred sample (10.0 mL) at room temperature. Stirring rate, tube size, degree of electrode immersion, and room temperature range are uniform for all samples and standards.
N.B. Gran and total fixed endpoint acidity are determined simultaneously.

INSTRUMENTATION:

Automated modular titration system with microcomputer control and data reduction software.

REPORTING:

Maximum Significant Figures: 3
Minimum Increment (W) : 0.01

CALIBRATION:

2 standard buffers covering the pH range of 4 to 7.

CONTROLS:

Calibration : LTBL plus two standards, eg, QCA

MODIFICATIONS:

01/04/82- Sample volume was decreased from 100.0 to 10.0 mL.
01/05/83- System was fully automated by introduction of a sampler, and an automated device for washing the electrode between analyses.

PH

QUALITY CONTROL DATA FROM 03/01/82 TO 23/12/82

LAB: Precipitation

Analytical Range: 0.00 to 14.00

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	210	6.86	6.86	-0.00	0.007
B :	210	4.01	4.01	0.00	0.013
A+B :	209	10.87	10.87	0.00	0.015
A-B :	209	2.85	2.85	-0.00	0.014

s.d(AB): Sw(within run): 0.010 S(between runs): 0.010 S/Sw: 1.04

On any given day the calibration is accepted if the values obtained lie within the ranges:

10.82 to 10.91 for A+B
2.82 to 2.88 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
1	1.00 - 3.00	N/A	N/A
31	3.00 - 4.00	0.040	1.16
93	4.00 - 5.00	0.026	0.58
36	5.00 - 6.00	0.054	0.98
30	6.00 - 9.00	0.081	1.08
191	Overall	0.049	N/A

OTHER CHECKS:

	<u>Number of Data</u>	<u>Data Mean</u>	<u>Standard Deviation</u>
Slope :	200	99.2	0.67

PH

QUALITY CONTROL DATA FROM 05/01/83 TO 22/12/83

LAB: Precipitation

Analytical Range: 0.00 to 14.00

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	134	6.86	6.84	-0.02	0.015
B :	134	4.01	4.00	-0.01	0.010
A+B :	133	10.87	10.85	-0.02	0.020
A-B :	133	2.85	2.84	-0.01	0.016

s.d(AB): Sw(within run): 0.011 S(between runs): 0.013 S/Sw: 1.15

On any given day the calibration is accepted if the values obtained lie within the ranges:

10.82 to 10.91 for A+B
2.82 to 2.88 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
0	1.00 - 3.00	N/A	N/A
9	3.00 - 4.00	0.014	0.40
17	4.00 - 5.00	0.038	0.85
6	5.00 - 6.00	0.070	1.28
4	6.00 - 9.00	0.037	0.49
36	Overall	0.046	N/A

OTHER CHECKS:

	<u>Number of Data</u>	<u>Data Mean</u>	<u>Standard Deviation</u>
Slope :	53	99.8	0.47

PH

QUALITY CONTROL DATA FROM 03/01/84 TO 21/12/84

LAB: Precipitation

Analytical Range: 0.00 to 14.00

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	162	6.86	6.86	-0.00	0.010
B :	162	4.01	4.01	0.00	0.008
A+B :	161	10.87	10.87	-0.00	0.015
A-B :	161	2.85	2.85	-0.00	0.010

s.d(AB): Sw(within run): 0.007 S(between runs): 0.009 S/Sw: 1.25

On any given day the calibration is accepted if the values obtained lie within the ranges:

10.82 to 10.91 for A+B
2.82 to 2.88 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
1	1.00 - 3.00	N/A	N/A
29	3.00 - 4.00	0.029	0.84
120	4.00 - 5.00	0.121	2.69
20	5.00 - 6.00	0.104	1.90
20	6.00 - 9.00	0.100	1.33
190	Overall	0.109	N/A

OTHER CHECKS:

	<u>Number of Data</u>	<u>Data Mean</u>	<u>Standard Deviation</u>
Slope :	159	98.5	0.50

*** PHOSPHORUS-TOTAL ***

IDENTIFICATION:

Laboratory	: Rivers and Lakes	Method Introduced:	01/04/79
LIS Test Name Code:	PPUT	Units	: mg/L as P
Work Station Code	: RTNF	Unit Code	: 064B15
Method Code	: 504AC2	Supervisor	: J. Crowther
Sample Type/Matrix: Rivers, Lakes, Precipitation, Soil Extracts, Effluents.			

SAMPLING:

Quantity Required: 50 mL
Container : Glass or plastic (polystyrene)

ANALYTICAL PROCEDURE:

Samples are digested in a sulphuric acid-mercuric oxide-potassium sulphate media using two block digesters kept at 200 C and 360 C. The pH of the digestate is adjusted in-line and then orthophosphate is determined by formation of the reduced phospho-antimonyl-molybdate complex using ascorbic acid as the reducing agent.

Approximate absorbance : 0.4 at the 0.20 mg/L as P level.

N.B. Total Kjeldahl nitrogen is determined simultaneously.

INSTRUMENTATION:

- Block digesters(2)
- Basic automated modular continuous flow system with colourimetric measurement through a 5.0 cm. light path at 880 nm using appropriate phototube.
- Data capture, reduction, and processing via a multi-stage microcomputer system

REPORTING:

Maximum Significant Figures: 3
Minimum Increment (W) : 0.001

Detection Criterion (T): 0.005

CALIBRATION:

BL plus 4 undigested standards

CONTROLS:

Calibration : LTBL plus 2 undigested standards, eg, QCA
Recovery : 3 digested BL plus 3 digested standards in duplicate, eg, R1
Drift : BL plus 1 undigested standard

MODIFICATIONS:

15/08/83 - Microcomputer system was introduced. At this time the calibration technique was changed from linear interpolation to the use of a quadratic.

NOTES:

System is calibrated with undigested standards, but sample concentrations are adjusted to reflect day's value for digested blank.

PHOSPHORUS - TOTAL

QUALITY CONTROL DATA FROM 05/01/82 TO 23/12/82

LAB: Rivers and Lakes

Analytical Range: 0.005 to 0.200 mg/L as P

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	158	0.1500	0.1504	0.0004	0.00098
B :	158	0.0500	0.0503	0.0003	0.00071
A+B :	157	0.2000	0.2006	0.0006	0.00147
A-B :	157	0.1000	0.1001	0.0001	0.00087

s.d(AB): Sw(within run): 0.00062 S(between runs): 0.00086 S/Sw: 1.39

On any given day the calibration is accepted if the values obtained lie within the ranges:

0.1910 to 0.2090 for A+B
0.0940 to 0.1060 for A-B

RECOVERIES:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Standard Deviation</u>
R1 :	301	0.140	0.141	0.0051
R2 :	299	0.080	0.085	0.0040
R3 :	290	0.030	0.030	0.0035

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
420	0.000 - 0.040	0.0030	14.98
67	0.040 - 0.100	0.0027	3.83
24	0.100 - 0.200	0.0040	2.70
511	Overall	0.0030	N/A

DETECTION CRITERION: 0.005

OTHER CHECKS:

	<u>Number of Data</u>	<u>Data Mean</u>	<u>Standard Deviation</u>
Long Term Blank :	157	0.0005	0.00050
Digested Blank :	276	0.0035	0.00331
Standard Cal :	158	410.1	12.68

PHOSPHORUS - TOTAL

QUALITY CONTROL DATA FROM 05/01/83 TO 05/12/83

LAB: Rivers and Lakes

Analytical Range: 0.006 to 0.200 mg/L as P

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	141	0.1500	0.1490	-0.0010	0.00149
B :	141	0.0500	0.0496	-0.0004	0.00105
A+B :	140	0.2000	0.1987	-0.0014	0.00223
A-B :	140	0.1000	0.0994	-0.0006	0.00129

s.d(AB): Sw(within run): 0.00091 S(between runs): 0.00129 S/Sw: 1.42

On any given day the calibration is accepted if the values obtained lie within the ranges:

0.1910 to 0.2090 for A+B
0.0940 to 0.1060 for A-B

RECOVERIES:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Standard Deviation</u>
R1 :	269	0.140	0.135	0.0050
R2 :	270	0.080	0.082	0.0041
R3 :	269	0.030	0.028	0.0024

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
233	0.000 - 0.040	0.0034	16.89
48	0.040 - 0.100	0.0052	7.37
15	0.100 - 0.200	0.0064	4.29
296	Overall	0.0040	N/A

DETECTION CRITERION: 0.006

OTHER CHECKS:

	<u>Number of Data</u>	<u>Data Mean</u>	<u>Standard Deviation</u>
Long Term Blank :	139	0.0006	0.00097
Digested Blank :	349	0.0026	0.00179
Standard Cal :	66	400	17.4

PHOSPHORUS - TOTAL

QUALITY CONTROL DATA FROM 03/01/84 TO 31/12/84

LAB: Rivers and Lakes

Analytical Range: 0.004 to 0.200 mg/L as P

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	156	0.1500	0.1484	-0.0016	0.00106
B :	156	0.0500	0.0494	-0.0006	0.00099
A+B :	155	0.2000	0.1977	-0.0023	0.00155
A-B :	155	0.1000	0.0990	-0.0010	0.00135

s.d(AB): Sw(within run): 0.00095 S(between runs): 0.00102 S/Sw: 1.07

On any given day the calibration is accepted if the values obtained lie within the ranges:

0.1910 to 0.2090 for A+B
0.0940 to 0.1060 for A-B

RECOVERIES:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Standard Deviation</u>
R1 :	307	0.140	0.136	0.0175
R2 :	305	0.080	0.082	0.0054
R3 :	303	0.030	0.029	0.0035

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
256	0.000 - 0.040	0.0022	11.07
52	0.040 - 0.100	0.0041	5.85
18	0.100 - 0.200	0.0053	3.52
326	Overall	0.0029	N/A

DETECTION CRITERION: 0.004

OTHER CHECKS:

	<u>Number of Data</u>	<u>Data Mean</u>	<u>Standard Deviation</u>
Long Term Blank :	156	0.0010	0.00016
Digested Blank :	156	0.0026	0.00181
Standard Cal :	58	388	16.1

*** POTASSIUM ***

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	18/05/79
LIS Test Name Code:	KKUR	Units	: mg/L as K
Work Station Code	: PRAA	Unit Code	: 064819
Method Code	: 002EA1	Supervisor	: M. Rawlings
Sample Type/Matrix: Precipitation, Throughfall, Stemflow.			

SAMPLING:

Quantity Required: 25 mL
Container : Polystyrene

ANALYTICAL PROCEDURE:

Samples are analysed by AAS at 766.5 nm with an air-acetylene flame. Cesium is added as a suppressant via an automated sampling train.
Approximate absorbance: 0.5 at the 1.00 mg/L level.

INSTRUMENTATION:

Automated modular continuous flow atomic absorption spectrophotometer (AAS) system

REPORTING:

Maximum Significant Figures: 3	
Minimum Increment (W) : 0.005	Detection Criterion (T): 0.014

CALIBRATION:

BL plus 6 standards

CONTROLS:

Calibration : 2 standards, eg. QCA
Drift : BL plus 2 standards every 10 samples

POTASSIUM

QUALITY CONTROL DATA FROM 01/01/82 TO 23/12/82

LAB: Precipitation

Analytical Range: 0.01 to 1.00 mg/L as K

CALIBRATION CONTROL:

	Number of Data	Expected Concn	Av. Concn Measured	Av. Bias	Standard Deviation
A :	89	0.60	0.60	-0.00	0.009
B :	89	0.10	0.09	-0.01	0.010
A+B :	89	0.70	0.69	-0.01	0.014
A-B :	89	0.50	0.51	0.01	0.012

s.d(AB): Sw(within run): 0.009 S(between runs): 0.009 S/Sw: 1.10

On any given day the calibration is accepted if the values obtained lie within the ranges:

0.66 to 0.75 for A+B
0.47 to 0.53 for A-B

DUPLICATES:

Number of Data Pairs	Sample Concn Span	Mean s.d.	Relative s.d. (%)
70	0.00 - 0.20	0.008	8.50
11	0.20 - 0.50	0.014	3.90
5	0.50 - 1.00	0.044	5.86
86	Overall	0.014	N/A

DETECTION CRITERION: 0.01

POTASSIUM

QUALITY CONTROL DATA FROM 06/01/83 TO 29/12/83

LAB: Precipitation

Analytical Range: 0.01 to 1.00 mg/L as K

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	46	0.60	0.61	0.01	0.009
B :	46	0.10	0.10	-0.00	0.007
A+B :	46	0.70	0.70	0.00	0.012
A-B :	46	0.50	0.51	0.01	0.011

s.d(AB): Sw(within run): 0.008 S(between runs): 0.008 S/Sw: 1.03

On any given day the calibration is accepted if the values obtained lie within the ranges:

0.66 to 0.75 for A+B
0.47 to 0.53 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
8	0.00 - 0.20	0.006	5.63
0	0.20 - 0.50	N/A	N/A
0	0.50 - 1.00	N/A	N/A
8	Overall	0.006	N/A

DETECTION CRITERION: 0.01

POTASSIUM

QUALITY CONTROL DATA FROM 04/01/84 TO 19/12/84

LAB: Precipitation

Analytical Range: 0.01 to 1.00 mg/L as K

CALIBRATION CONTROL:

	Number of Data	Expected Concn	Av. Concn Measured	Av. Bias	Standard Deviation
A :	51	0.60	0.61	0.01	0.009
B :	51	0.10	0.09	-0.01	0.006
A+B :	51	0.70	0.70	0.00	0.012
A-B :	51	0.50	0.52	0.02	0.010

s.d(AB): Sw(within run): 0.007 S(between runs): 0.008 S/Sw: 1.11

On any given day the calibration is accepted if the values obtained lie within the ranges:

0.66 to 0.75 for A+B
0.47 to 0.53 for A-B

DUPLICATES:

Number of Data Pairs	Sample Concn Span	Mean s.d.	Relative s.d. (%)
76	0.00 - 0.20	0.007	6.74
3	0.20 - 0.50	0.013	3.60
2	0.50 - 1.00	0.007	0.94
81	Overall	0.007	N/A

DETECTION CRITERION: 0.01

*** SODIUM ***

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	18/05/79
LIS Test Name Code:	NAUR	Units	: mg/L as Na
Work Station Code	: PRAA	Unit Code	: 064811
Method Code	: 002EA1	Supervisor	: M. Rawlings
Sample Type/Matrix: Precipitation, Throughfall, Stemflow.			

SAMPLING:

Quantity Required: 25 mL
Container : Polystyrene

ANALYTICAL PROCEDURE:

Samples are analysed by AAS at 589.0 nm with an air-acetylene flame. Potassium is added as a suppressant via an automated sampling train.
Approximate absorbance: 0.5 at the 1.00 mg/L level.

INSTRUMENTATION:

Automated modular continuous flow atomic absorption spectrophotometer (AAS) system

REPORTING:

Maximum Significant Figures: 3	
Minimum Increment (W) : 0.005	Detection Criterion (T): 0.02

CALIBRATION:

BL plus 6 standards

CONTROLS:

Calibration : 2 standards, eg. QCA
Drift : BL plus 2 standards every 10 samples

SODIUM

QUALITY CONTROL DATA FROM 01/01/82 TO 25/12/82

LAB: Precipitation

Analytical Range: 0.02 to 1.00 mg/L as Na

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	99	0.60	0.60	-0.00	0.007
B :	98	0.10	0.10	-0.00	0.007
A+B :	98	0.70	0.70	-0.00	0.010
A-B :	98	0.50	0.50	0.00	0.009

s.d(AB): Sw(within run): 0.007

S(between runs): 0.007

S/Sw: 1.05

On any given day the calibration is accepted if the values obtained lie within the ranges:

0.66 to 0.75 for A+B
0.47 to 0.53 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
71	0.00 - 0.20	0.012	11.52
14	0.20 - 0.50	0.006	1.77
6	0.50 - 1.00	0.013	1.77
91	Overall	0.011	N/A

DETECTION CRITERION: 0.02

SODIUM

QUALITY CONTROL DATA FROM 06/01/83 TO 29/12/83

LAB: Precipitation

Analytical Range: 0.01 to 1.00 mg/L as Na

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	48	0.60	0.60	0.00	0.010
B :	48	0.10	0.10	0.00	0.009
A+B :	48	0.70	0.71	0.01	0.016
A-B :	48	0.50	0.50	0.00	0.012

s.d(AB): Sw(within run): 0.008

S(between runs): 0.010

S/Sw: 1.19

On any given day the calibration is accepted if the values obtained lie within the ranges:

0.66 to 0.75 for A+B

0.47 to 0.53 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
24	0.00 - 0.20	0.006	5.61
1	0.20 - 0.50	N/A	N/A
0	0.50 - 1.00	N/A	N/A
25	Overall	0.028	N/A

DETECTION CRITERION: 0.01

SODIUM

QUALITY CONTROL DATA FROM 04/01/84 TO 18/12/84

LAB: Precipitation

Analytical Range: 0.01 to 1.00 mg/L as Na

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	53	0.60	0.61	0.01	0.011
B :	53	0.10	0.10	-0.00	0.006
A+B :	53	0.70	0.71	0.01	0.012
A-B :	53	0.50	0.51	0.01	0.013

s.d(AB): Sw(within run): 0.009

S(between runs): 0.009

S/Sw: 0.98

On any given day the calibration is accepted if the values obtained lie within the ranges:

0.66 to 0.75 for A+B
0.47 to 0.53 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
90	0.00 - 0.20	0.007	6.78
6	0.20 - 0.50	0.004	1.08
0	0.50 - 1.00	N/A	N/A
96	Overall	0.007	N/A

DETECTION CRITERION: 0.01

*** SULPHATE - PRECIPITATION ***

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	01/04/78
LIS Test Name Code:	SS04UR	Units	: mg/L as SO ₄
Work Station Code	: PRIC1	Unit Code	: 064941
Method Code	: 003A10	Supervisor	: M. Rawlings
Sample Type/Matrix: Precipitation, Throughfall, Stemflow.			

SAMPLING:

Quantity Required: 15 mL
Container : Polystyrene

ANALYTICAL PROCEDURE:

Sulphate is separated from other anions in the sample by automated suppressed ion chromatography using an eluent mixture of 0.003M sodium bicarbonate and 0.0024M sodium carbonate with conductivity detection. Samples are spiked with Na₂CO₃/NaHCO₃ to match the eluent strength and maintain background conductivity. The concentration of sulphate in mg/L as SO₄ is determined by comparison of the sample scan to a series of standard scans.

Full scale conductivity : 10 uS/cm.

Nitrate and chloride are determined simultaneously.

INSTRUMENTATION:

Basic modular continuous flow ion chromatographic system plus microcomputer for automated sample introduction and timing.

REPORTING:

Maximum Significant Figures: 3

Minimum Increment (W) : 0.05

Detection Criterion (T): 0.07

CALIBRATION:

BL plus 6 standards

CONTROLS:

Calibration : 2 standards, eg. QCA

Drift : 1 standard every 10 samples

SULPHATE

QUALITY CONTROL DATA FROM 06/01/82 TO 24/12/82

LAB: Precipitation

Analytical Range: 0.07 to 10.00 mg/L as SO₄

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	241	8.00	7.99	-0.01	0.077
B :	242	2.00	1.98	-0.02	0.038
A+B :	239	10.00	9.97	-0.03	0.089
A-B :	239	6.00	6.01	0.01	0.082

s.d(AB): Sw(within run): 0.058 S(between runs): 0.060 S/Sw: 1.04

On any given day the calibration is accepted if the values obtained lie within the ranges:

9.55 to 10.45 for A+B
5.70 to 6.30 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
90	0.00 - 2.00	0.043	4.26
120	2.00 - 5.00	0.083	2.37
60	5.00 - 10.00	0.100	1.33
270	Overall	0.081	N/A

DETECTION CRITERION: 0.07

SULPHATE

QUALITY CONTROL DATA FROM 04/01/83 TO 22/12/83

LAB: Precipitation

Analytical Range: 0.07 to 10.00 mg/L as SO_4

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	317	8.00	7.96	-0.04	0.082
B :	317	2.00	2.01	0.01	0.038
A+B :	316	10.00	9.97	-0.03	0.089
A-B :	316	6.00	5.96	-0.04	0.091

s.d(AB): Sw(within run): 0.064

S(between runs): 0.064

S/Sw: 0.99

On any given day the calibration is accepted if the values obtained lie within the ranges:

9.55 to 10.45 for A+B
5.70 to 6.30 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
96	0.00 - 2.00	0.044	4.44
119	2.00 - 5.00	0.064	1.81
52	5.00 - 10.00	0.116	1.54
267	Overall	0.073	N/A

DETECTION CRITERION: 0.07

SULPHATE

QUALITY CONTROL DATA FROM 09/01/84 TO 20/12/84

LAB: Precipitation

Analytical Range: 0.06 to 10.00 mg/L as SO₄

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	170	8.00	8.00	-0.00	0.085
B :	170	2.00	2.01	0.01	0.039
A+B :	169	10.00	10.01	0.01	0.100
A-B :	169	6.00	5.99	-0.01	0.088

s.d(AB): Sw(within run): 0.062 S(between runs): 0.066 S/Sw: 1.07

On any given day the calibration is accepted if the values obtained lie within the ranges:

9.55 to 10.45 for A+B
5.70 to 6.30 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
103	0.00 - 2.00	0.039	3.91
123	2.00 - 5.00	0.073	2.08
53	5.00 - 10.00	0.107	1.43
279	Overall	0.074	N/A

DETECTION CRITERION: 0.06

IDENTIFICATION:

Laboratory	: Precipitation	Method Introduced:	01/07/80
LIS Test Name Code:	SS04FR SS04NF	Units	: ug/Filter as SO ₄
Work Station Code	: PRSED	Unit Code	: 361941
Method Code	: 004A10	Supervisor	: M. Rawlings

Sample Type/Matrix: Teflon and nylon filters from sequential filter packs and nylon filters from LoVol filter packs.

SAMPLING:

Quantity Required: 1 filter
Container : Polyethylene bag

SAMPLE PREPARATION:

Filters are extracted with 25 ml. of DDW (teflon) or 25 ml. of .03N NaOH (nylon) in polystyrene tubes with ultrasonic treatment followed by a 24 hour rest period.

ANALYTICAL PROCEDURE:

Sulphate is separated from other anions in the sample extract by automated suppressed ion chromatography using an eluent mixture of 0.003M sodium bicarbonate and 0.0024M sodium carbonate with conductivity detection. Samples are spiked with Na₂CO₃/NaHCO₃ to match the eluent strength and maintain background conductivity. The concentration of sulphate in ug/L as SO₄ is determined by comparison of the sample scan to a series of standard scans. Results are converted to ug/filter as SO₄.

Full scale conductivity : 30 uS/cm.

Nitrate and chloride are determined simultaneously.

INSTRUMENTATION:

- Ultrasonic bath: polystyrene tubes
- Basic modular continuous flow ion chromatographic system plus microcomputer for automated sample introduction and timing.

REPORTING:

Maximum Significant Figures: 3

Minimum Increment (W) : 1.25 ug/filter Detection Criterion (T): 2 ug/filter

CALIBRATION:

BL plus 6 standards

CONTROLS:

Calibration : 2 standards, eg, OCA

Drift : 1 standard every 10 samples

MODIFICATIONS:

01/07/80 - Ion chromatographic procedure for precipitation samples was modified for analysis of teflon and nylon filter extracts by developing the above filter extraction procedure

10/03/84 - Microcomputer for automated sampling and timing was introduced. At that time automated spiking of samples with Na₂CO₃/NaHCO₃ was introduced.

NOTES:

Detection criterion is based on duplicate analyses of the extract from one filter because duplicate filters are not received.

SULPHATE

QUALITY CONTROL DATA FROM 06/01/82 TO 03/12/82

LAB: Precipitation

Analytical Range: 3.9 to 250.0 ug/filter as SO₄

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	138	200.0	200.2	0.2	2.68
B :	141	50.0	50.7	0.7	1.13
A+B :	137	250.0	250.9	0.9	2.95
A-B :	137	150.0	149.5	-0.5	2.86

s.d(AB): Sw(within run): 2.02

S(between runs): 2.06

S/Sw: 1.02

On any given day the calibration is accepted if the values obtained lie within the ranges:

238.8 to 261.3 for A+B
142.5 to 157.5 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
62	0.0 - 50.0	2.37	9.47
6	50.0 - 125.0	2.74	3.13
0	125.0 - 250.0	N/A	N/A
68	Overall	2.39	N/A

DETECTION CRITERION: 3.9

SULPHATE

QUALITY CONTROL DATA FROM 04/01/83 TO 22/12/83

LAB: Precipitation

Analytical Range: 1.5 to 250.0 ug/filter as SO₄

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	85	200.0	199.3	-0.7	2.19
B :	85	50.0	51.2	1.2	2.27
A+B :	85	250.0	250.5	0.5	3.57
A-B :	85	150.0	148.1	-1.9	2.66

s.d(AB): Sw(within run): 1.88

S(between runs): 2.23

S/Sw: 1.18

On any given day the calibration is accepted if the values obtained lie within the ranges:

238.8 to 261.3 for A+B

142.5 to 157.5 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
29	0.0 - 50.0	0.91	3.62
8	50.0 - 125.0	10.55	12.06
2	125.0 - 250.0	3.54	1.89
39	Overall	5.24	N/A

DETECTION CRITERION: 1.5

SULPHATE

QUALITY CONTROL DATA FROM 03/01/84 TO 27/12/84

LAB: Precipitation

Analytical Range: 2.3 to 250.0 ug/filter as SO₄

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	136	200.0	201.0	1.0	2.43
B :	136	50.0	51.0	1.0	1.33
A+B :	135	250.0	252.0	2.0	2.84
A-B :	135	150.0	149.9	-0.1	2.69

s.d(AB): Sw(within run): 1.90 S(between runs): 1.96 S/Sw: 1.03

On any given day the calibration is accepted if the values obtained lie within the ranges:

238.8 to 261.3 for A+B
142.5 to 157.5 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
113	0.0 - 50.0	1.42	5.69
17	50.0 - 125.0	5.21	5.96
7	125.0 - 250.0	4.60	2.46
137	Overall	2.52	N/A

DETECTION CRITERION: 2.3

*** SULPHATE ***

IDENTIFICATION:

Laboratory : Precipitation Method Introduced: 01/07/80
LIS Test Name Code: SS04UR Units : ug/Filter as SO4
Work Station Code : PRLOV Unit Code : 361941
Method Code : 004AIC Supervisor : M. Rawlings
Sample Type/Matrix: W40 filters from LoVol filter packs.

SAMPLING:

Quantity Required: 1 filter
Container : Polyethylene bags

SAMPLE PREPARATION:

Filters are extracted with 50.0 mL of DDW in polyethylene tubes with ultrasonic treatment followed by a 24 hour rest period.

ANALYTICAL PROCEDURE:

Sulphate is separated from other anions in the sample extract by automated suppressed ion chromatography using an eluent mixture of 0.003M sodium bicarbonate and 0.0024M sodium carbonate with conductivity detection. Samples are spiked with Na₂CO₃/NaHCO₃ to match the eluent strength and maintain background conductivity. The concentration of sulphate in mg/L as SO₄ is determined by comparison of the sample scan to a series of standard scans. Results are converted to ug/filter as SO₄.

Full scale conductivity : 30 uS/cm.

N.B. Nitrate and chloride are determined simultaneously.

INSTRUMENTATION:

-Ultrasonic bath: polyethylene tubes
-Basic modular continuous flow ion chromatographic system plus microcomputer for automated sample introduction and timing.

REPORTING:

Maximum Significant Figures: 3

Minimum Increment (W) : 2.50 ug/filter Detection Criterion (T): 5 ug/filter

CALIBRATION:

BL plus 6 standards

CONTROLS:

Calibration : 2 standards, eg, QCA

Drift : 1 standard every 10 samples

MODIFICATIONS:

01/08/81 - Ion chromatographic procedure for precipitation samples was modified for analysis of LoVol W40 filter extracts by developing the above filter extraction procedure.

10/03/84 - Microcomputer for automated sampling and timing was introduced. At that time automated spiking of samples with Na₂CO₃/NaHCO₃ was introduced.

NOTES:

Detection criterion is based on duplicate analyses of the extract from one filter because duplicate filters are not received.

SULPHATE

QUALITY CONTROL DATA FROM 06/01/82 TO 03/12/82

LAB: Precipitation

Analytical Range: 7.8 to 500.0 ug/filter as SO₄

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	138	400.0	400.4	0.4	5.36
B :	141	100.0	101.4	1.4	2.26
A+B :	137	500.0	501.9	1.9	5.90
A-B :	137	300.0	299.0	-1.0	5.72

s.d(AB): Sw(within run): 4.04

S(between runs): 4.11

S/Sw: 1.02

On any given day the calibration is accepted if the values obtained lie within the ranges:

477.5 to 522.5 for A+B

285.0 to 315.0 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
62	0.0 - 100.0	4.74	9.47
6	100.0 - 250.0	5.48	3.13
0	250.0 - 500.0	N/A	N/A
68	Overall	4.78	N/A

DETECTION CRITERION: 7.8

SULPHATE

QUALITY CONTROL DATA FROM 04/01/83 TO 22/12/83

LAB: Precipitation

Analytical Range: 3.0 to 500.0 ug/filter as SO₄

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	85	400.0	398.6	-1.4	4.37
B :	85	100.0	102.4	2.4	4.54
A+B :	85	500.0	501.0	1.0	7.15
A-B :	85	300.0	296.2	-3.8	5.32

s.d(AB): Sw(within run): 3.76

S(between runs): 4.45

S/Sw: 1.18

On any given day the calibration is accepted if the values obtained lie within the ranges:

477.5 to 522.5 for A+B
285.0 to 315.0 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
29	0.0 - 100.0	1.81	3.62
8	100.0 - 250.0	21.11	12.06
2	250.0 - 500.0	7.07	1.89
39	Overall	10.47	N/A

DETECTION CRITERION: 3.0

SULPHATE

QUALITY CONTROL DATA FROM 03/01/84 TO 27/12/84

LAB: Precipitation

Analytical Range: 4.7 to 500.0 ug/filter as SO₄

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	136	400.0	401.9	1.9	4.85
B :	136	100.0	102.1	2.1	2.66
A+B :	135	500.0	504.0	4.0	5.68
A-B :	135	300.0	299.9	-0.1	5.39

s.d(AB): Sw(within run): 3.81

S(between runs): 3.91

S/Sw: 1.03

On any given day the calibration is accepted if the values obtained lie within the ranges:

477.5 to 522.5 for A+B
285.0 to 315.0 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
113	0.0 - 100.0	2.84	5.69
17	100.0 - 250.0	10.43	5.96
7	250.0 - 500.0	9.21	2.46
137	Overall	5.05	N/A

DETECTION CRITERION: 4.7

IDENTIFICATION:

Laboratory : Precipitation Method Introduced: 01/07/80
LIS Test Name Code: SS02FR Units : ug/Filter as SO2
Work Station Code : PRSEQ,PRLOV Unit Code : 361943
Method Code : 004AIQ Supervisor : M. Rawlings
Sample Type/Matrix: Impregnated W41 filters from sequential and LoVol filter packs.

SAMPLING:

Quantity Required: 1 filter
Container : Polyethylene bags
Other : Filter is impregnated with potassium carbonate/glycerol solution.

SAMPLE PREPARATION:

Filters are extracted with 50 ml. of 0.05% H2O2 in polystyrene tubes with 1 hour of mechanical shaking, followed by ultrasonic treatment to enhance extraction, then a 24 hour rest period. SO2 is converted to SO4 in the process.

ANALYTICAL PROCEDURE:

Sulphate is separated from other anions in the sample extract by automated suppressed ion chromatography using an eluent mixture of 0.003M sodium bicarbonate and 0.0024M sodium carbonate with conductivity detection. Samples are spiked with Na2CO3/NaHCO3 to match the eluent strength and maintain background conductivity. The concentration of sulphate in ug/L as SO4 is determined by comparison of the sample scan to a series of standard scans. Results are converted to ug/filter as SO2.
Full scale conductivity : 10 uS/cm.

INSTRUMENTATION:

-Mechanical shaker; ultrasonic bath; polyethylene tubes
-Basic modular continuous flow ion chromatographic system plus microcomputer for automated sample introduction and timing.

REPORTING:

Maximum Significant Figures: 3
Minimum Increment (W) : 1.65 ug/filter Detection Criterion (T): 6 ug/filter

CALIBRATION:

BL plus 6 standards

CONTROLS:

Calibration : 2 standards, eg. QCA
Drift : 1 standard every 10 samples

MODIFICATIONS:

01/07/80 - Ion chromatographic procedure for precipitation samples was modified for analysis of W41 filter extracts by developing the extraction procedure.
10/03/84 - Microcomputer for automated sampling and timing was introduced. At that time automated spiking of samples with Na2CO3/NaHCO3 was introduced.
15/03/84 - Streamlined procedure for extraction of W41 filters in one 50 mL polyethylene tube was adopted, eliminating two container transfers, and changing the extraction volume to 50.0 mL from 100.0 mL.

NOTES:

Detection criterion is based on duplicate analyses of the extract from one filter because duplicate filters are not received.

SULPHUR DIOXIDE

QUALITY CONTROL DATA FROM 04/01/82 TO 01/12/82

LAB: Precipitation

Analytical Range: 9.0 to 700 ug/filter as SO₂

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	65	533.3	532.9	-0.4	11.87
B :	65	133.3	134.4	1.0	4.93
A+B :	64	666.7	668.0	1.4	11.28
A-B :	64	400.0	399.4	-0.6	11.34

s.d(AD): Sw(within run): 8.02

S(between runs): 9.09

S/Sw: 1.13

On any given day the calibration is accepted if the values obtained lie within the ranges:

636.7 to 696.7 for A+B
380.0 to 420.0 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
17	0.0 - 200.0	5.47	5.47
4	200.0 - 300.0	7.20	2.88
7	300.0 - 700	7.3	1.46
28	Overall	6.5	N/A

DETECTION CRITERION: 9.0

SULPHUR DIOXIDE

QUALITY CONTROL DATA FROM 10/01/83 TO 06/03/84

LAB: Precipitation

Analytical Range: 11.8 to 700 ug/filter as SO₂

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	62	533.3	536.2	2.9	7.50
B :	89	133.3	144.4	11.1	8.39
A+B :	62	666.7	681.2	14.5	11.63
A-B :	62	400.0	391.3	-8.7	12.05

s.d(AB): Sw(within run): 8.52

S(between runs): 7.96

S/Sw: 0.93

On any given day the calibration is accepted if the values obtained lie within the ranges:

636.7 to 696.7 for A+B
380.0 to 420.0 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
33	0.0 - 200.0	7.21	7.21
4	200.0 - 300.0	16.33	6.53
0	300.0 - 700	N/A	N/A
37	Overall	8.9	N/A

DETECTION CRITERION: 11.8

SULPHUR DIOXIDE

QUALITY CONTROL DATA FROM 11/05/84 TO 27/12/84

LAB: Precipitation

Analytical Range: 5.5 to 350 ug/filter as SO₂

CALIBRATION CONTROL:

	<u>Number of Data</u>	<u>Expected Concn</u>	<u>Av. Concn Measured</u>	<u>Av. Bias</u>	<u>Standard Deviation</u>
A :	91	266.7	267.4	0.8	3.16
B :	91	66.7	67.3	0.7	1.74
A+B :	91	333.3	334.7	1.4	3.72
A-B :	91	200.0	200.1	0.1	3.48

s.d(AB): Sw(within run): 2.46

S(between runs): 2.55

S/Sw: 1.03

On any given day the calibration is accepted if the values obtained lie within the ranges:

318.3 to 348.3 for A+B
190.0 to 210.0 for A-B

DUPLICATES:

<u>Number of Data Pairs</u>	<u>Sample Concn Span</u>	<u>Mean s.d.</u>	<u>Relative s.d. (%)</u>
96	0.0 - 100.0	3.33	6.67
11	100.0 - 150.0	4.04	3.23
20	150.0 - 350	8.3	3.32
127	Overall	4.9	N/A

DETECTION CRITERION: 5.5

APPENDIX 8

Test Name: Aluminum

Units: $\mu\text{gm/ml}$

Calibration:

	<u>Wavelength</u> <u>nm.</u>	<u>Conc. Range</u>	<u>Operating</u> <u>Scale</u>	<u>Resolution</u>	<u># Std.</u>
C.F.AAS	309.3	.005 - .300	0 - 0.40	.001	7
ICP		0 - 500 ppm			5

Quality Control Data:

	<u># of</u> <u>Datums</u>	<u>Mean</u>	<u>Std.</u> <u>Dev.</u>	<u>2X</u> <u>S.D.</u>	<u>3X</u> <u>S.D.</u>	<u>%</u> <u>R.S.D.</u>	<u>True</u> <u>Value</u>	<u>Mean</u> % <u>T.V.</u>
<u>GFAAS:</u>								
EPA 4/100	38	.079	.0148	.0300	.0445	19	.084	94
EPA 4/500	38	.0126	.0029	.0058	.0087	23	.0120	105
<u>ICP:</u>								
MC-1	19	.0292	.0030	.0060	.0090	10		
MC-2	19	.1614	.0110	.0220	.0330	7		

Blank Levels:

	<u># of Datums</u>	<u>Mean</u>	<u>Standard Deviation</u>
*ICP:	51	.0133	.0091
GFAAS:	60	<.005	<.005

Duplicate Data:

ICP:

	<u>0-20%</u>	<u>20-50%</u>	<u>50-100%</u>	<u>Overall</u>
Number:	31	37	15	83
Standard dev. of differences:	.0017	.0054	.0067	.0056
Mean of differences:	.0013	.0070	.0094	.0053
Sample Conc. Range ($\mu\text{gm/ml}$)	0 - .019	.019 - .0475	.0475 - .095	

* Where ICP blank levels are above .005 $\mu\text{g/ml}$ samples are re-analyzed by GFAAS.

Test Name: Cadmium

Units: $\mu\text{gm/ml}$

Calibration:

	<u>Wavelength</u> <u>nm.</u>	<u>Conc. Range</u>	<u>Operating</u> <u>Scale</u>	<u>Resolution</u>	<u># Std.</u>
C.F.AAS	228.8	.0001 - .020	0 - 0.50	.001	6
ICP		0 - 100			5

Quality Control Data:

	<u># of</u> <u>Datums</u>	<u>Mean</u>	<u>Std.</u> <u>Dev.</u>	<u>2X</u> <u>S.D.</u>	<u>3X</u> <u>S.D.</u>	<u>%</u> <u>R.S.D.</u>	<u>True</u> <u>Value</u>	<u>Mean</u> % <u>T.V.</u>
<u>GFAAS:</u>								
EPA 4/100	32	.0022	.0004	.0007	.0011	18	.0025	88
EPA 4/500	32	.0005	.0001	.0002	.0003	20	.0005	100
<u>ICP:</u>								
MC-1	17	.0003	.00006	.0001	.0002	20		
MC-2	19	.0014	.0001	.0003	.0004	7		

Blank Levels:

	<u># of Datums</u>	<u>Mean</u>	<u>Standard Deviation</u>
ICP:	50	.0002	.00005
GFAAS:	60	<.0001	<.0001

Duplicate Data:

	<u>0-20%</u>	<u>20-50%</u>	<u>50-100%</u>	<u>Overall</u>
Number:	70	5		75
Standard dev. of differences:	.00006	.00011		.00008
Mean of differences:	.00002	.00022		.00003
Sample Conc. Range ($\mu\text{gm/ml}$)	0 - .0004	.0004 - .0010	.001 - .0020	

Test Name: Copper

Units: µgm/ml

Calibration:

	<u>Wavelength</u> <u>nm.</u>	<u>Conc. Range</u>	<u>Operating</u> <u>Scale</u>	<u>Resolution</u>	<u># Std.</u>
C.F.AAS	324.7	.001 - .200	0 - 0.90	.001	9
ICP		0 - 150 ppm			5

Quality Control Data:

	<u># of</u> <u>Datums</u>	<u>Mean</u>	<u>Std.</u> <u>Dev.</u>	<u>2X</u> <u>S.D.</u>	<u>3X</u> <u>S.D.</u>	<u>%</u> <u>R.S.D.</u>	<u>True</u> <u>Value</u>	<u>Mean</u> <u>T.V.</u> %
GFAAS:								
EPA 4/100	42	.0117	.0014	.0028	.0042	12	.011	106
EPA 4/500	42	.0028	.0009	.0019	.0028	32	.0022	127
ICP:								
IC-1	16	.0013	.0003	.0006	.0009	23		
IC-2	19	.0632	.0053	.0106	.0159	8		

Blank Levels:

	<u># of Datums</u>	<u>Mean</u>	<u>Standard Deviation</u>
ICP:	50	.0012	.0011
GFAAS:	60	<.001	<.001

Duplicate Data:

	<u>0-20%</u>	<u>20-50%</u>	<u>50-100%</u>	<u>Overall</u>
Number:	69	14	2	85
Standard dev. of differences:	.0004	.0006	.0002	.0004
Mean of differences:	.0003	.0006	.0004	.0004
Sample Conc. range (µgm/ml)	0 - .0034	.0034 - .0085	.0085 - .017	

Test Name: Iron

Units: $\mu\text{gm/ml}$

Calibration:

	<u>Wavelength nm.</u>	<u>Conc. Range</u>	<u>Operating Scale</u>	<u>Resolution</u>	<u># Std.</u>
C.F.AAS	248.3	.001 - .200	0 - 0.90	.001	8
ICP		0 - 500 ppm			5

Quality Control Data:

	<u># of Datums</u>	<u>Mean</u>	<u>Std. Dec.</u>	<u>2X S.D.</u>	<u>3X S.D.</u>	<u>% R.S.D.</u>	<u>True Value</u>	<u>Mean T.V. %</u>
<u>GFAAS:</u>								
EPA 4/100	50	.0215	.0026	.0051	.0077	12	.020	108
EPA 4/500	48	.0044	.0012	.0023	.0035	27	.004	110
<u>ICP:</u>								
MC-1	19	.0171	.0019	.0038	.0057	11		
MC-2	19	.1278	.0097	.0193	.0290	8		

Blank Levels:

	<u># of Datums</u>	<u>Mean</u>	<u>Standard Deviation</u>
ICP:	49	.0038	.0053
GFAAS:	60	.0012	.0013

Duplicate Data:

Icp:

	<u>0-20%</u>	<u>20-50%</u>	<u>50-100%</u>	<u>Overall</u>
Number:	58	15	7	80
Standard dev. of differences:	.0022	.0041	.0088	.0052
Mean of differences:	.0020	.0069	.0146	.0040
Sample Conc. Range ($\mu\text{gm/ml}$)	0 - .025	.025 - .0625	.0625 - .1250	

Test Name: Lead

Units: $\mu\text{gm/ml}$

Calibration:

	<u>Wavelength</u> <u>nm.</u>	<u>Conc. Range</u>	<u>Operating</u> <u>Scale</u>	<u>Resolution</u>	<u># Std.</u>
C.F.AAS	217.00	.001 - .200	0 - 0.60	.001	8
ICP		0 - 100			5

Quality Control Data:

	<u># of</u> <u>Datums</u>	<u>Mean</u>	<u>Std.</u> <u>Dev.</u>	<u>2X</u> <u>S.D.</u>	<u>3X</u> <u>S.D.</u>	<u>%</u> <u>R.S.D.</u>	<u>True</u> <u>Value</u>	<u>Mean</u> <u>T.V.</u>	<u>%</u>
<u>GFAAS:</u>									
EPA 4/100	45	.0203	.0029	.0057	.0086	14	.024	84	
EPA 4/500	45	.0045	.0010	.0019	.0029	22	.0048	94	
<u>ICP:</u>									
MC-1	15	.0050	.0016	.0032	.0048	32			
MC-2	19	.0619	.0053	.0106	.0159	8			

Blank Levels:

	<u># of Datums</u>	<u>Mean</u>	<u>Standard Deviation</u>
ICP:	42	.0036	.0024
GFAAS:	60	.0015	.0017

Duplicate Data:

	<u>0-20%</u>	<u>20-50%</u>	<u>50-100%</u>	<u>Overall</u>
Number:	64	10	3	77
Standard dev.	.0006	.0011	.0008	.0007
of differences:				
Mean of	.0007	.0016	.0016	.0009
differences:				
Sample Conc.	0 - .012	.012 - .03	.03 - .06	
Range ($\mu\text{gm/ml}$)				

Test Name: Manganese

Units: $\mu\text{gm/ml}$

Calibration:

	<u>Wavelength nm.</u>	<u>Conc. Range</u>	<u>Operating Scale</u>	<u>Resolution</u>	<u># Std.</u>
C.F.AAS	279.5	.001 - .030	0 - 0.40	.001	5
ICP		0 - 100			5

Quality Control Data:

	<u># of Datums</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>2X S.D.</u>	<u>3X S.D.</u>	<u>% R.S.D.</u>	<u>True Value</u>	<u>Mean T.V.</u> %
<u>GFAAS:</u>								
EPA 4/100	27	.0154	.0018	.0036	.0054	12	.015	103
EPA 4/500	28	.0031	.0008	.0016	.0024	26	.003	103
<u>ICP:</u>								
MC-1	19	.0032	.0002	.0003	.0004	6		
MC-2	19	.0289	.0019	.0037	.0055	6		

Blank Levels:

	<u># of Datums</u>	<u>Mean</u>	<u>Standard Deviation</u>
ICP:	51	.0004	.00017
GFAAS:	60	<.001	<.001

Duplicate Data:

	<u>0-20%</u>	<u>20-50%</u>	<u>50-100%</u>	<u>Overall</u>
Number:	66	15	8	89
Standard dev. of differences:	.00019	.0006	.00042	.00034
Mean of differences:	.00012	.00042	.00045	.00020
Sample Conc. Range ($\mu\text{gm/ml}$)	0 - .0035	.0035 - .00875	.00875 - .0175	

Test Name: Nickel

Units: $\mu\text{gm/ml}$

Calibration:

	<u>Wavelength</u> <u>nm.</u>	<u>Conc. Range</u>	<u>Operating</u> <u>Scale</u>	<u>Resolution</u>	<u># Std.</u>
C.F.AAS	232.0	.001 - .200	0 - 0.50	.001	8
ICP		0 - 100			5

Quality Control Data:

	<u># of</u> <u>Datums</u>	<u>Mean</u>	<u>Std.</u> <u>Dev.</u>	<u>2X</u> <u>S.D.</u>	<u>3X</u> <u>S.D.</u>	<u>%</u> <u>R.S.D.</u>	<u>True</u> <u>Value</u>	<u>Mean</u> <u>T.V.</u> %
<u>GFAAS:</u>								
EPA 4/100	26	.0313	.0042	.0085	.0127	13	.030	104
EPA 4/500	26	.0063	.0014	.0028	.0041	22	.006	105
<u>ICP:</u>								
MC-1	16	.0006	.0002	.0005	.0008	33		
MC-2	19	.0567	.0044	.0089	.0134	8		

Blank Levels:

	<u># of Datums</u>	<u>Mean</u>	<u>Standard Deviation</u>
ICP:	56	.0005	.0003
GFAAS:	60	<.001	<.001

Duplicate Data:

ICP:

	<u>0-20%</u>	<u>20-50%</u>	<u>50-100%</u>	<u>Overall</u>
Number:	53	11	4	68
Standard dev. of differences:	.00014	.00025	.00029	.0002
Mean of differences:	.00008	.00029	.0004	.00014
Sample Conc. Range ($\mu\text{gm/ml}$)	.0 - .0007	.0007 - .0018	.0018 - .0036	

Test Name: Vanadium

Units: μ gm/ml

Calibration:

	<u>Wavelength nm.</u>	<u>Conc. Range</u>	<u>Operating Scale</u>	<u>Resolution</u>	<u># Std.</u>
C.F.AAS	318.4	.002 - .300	0 - 0.30	.001	8
ICP		0 - 100 ppm			5

Quality Control Data:

	<u># of Datums</u>	<u>Mean</u>	<u>Std. Dec.</u>	<u>2X S.D.</u>	<u>3X S.D.</u>	<u>% R.S.D.</u>	<u>True Value</u>	<u>Mean T.V. %</u>
<u>GFAAS:</u>								
EPA 4/100	18	.0773	.0067	.0135	.0020	9	.070	110
EPA 4/500	21	.0146	.0030	.0060	.0090	20	.014	104
<u>ICP:</u>								
MC-1	18	.0004	.0001	.0002	.0003	25		
MC-2	19	.0151	.0013	.0026	.0039	9		

Blank Levels:

	<u># of Datums</u>	<u>Mean</u>	<u>Standard Deviation</u>
ICP:	51	.0009	.0002
GFAAS:	60	< .002	< .002

Duplicate Data:

<u>Icp:</u>	<u>0-20%</u>	<u>20-50%</u>	<u>50-100%</u>	<u>Overall</u>
Number:	76	6	3	85
Standard dev. of differences:	.00006	.00019	.00045	.00014
Mean of differences:	.00005	.00015	.00053	.00007
Sample Conc. Range (μ gm/ml)	0 - .0008	.0008 - .002	.002 - .004	

Test Name: Zinc

Units: $\mu\text{gm/ml}$

Calibration:

	<u>Wavelength nm.</u>	<u>Conc. Range</u>	<u>Operating Scale</u>	<u>Resolution</u>	<u># Std.</u>
F.AAS	213.9	.002 - .200	0 - .050	.001	2
ICP		0 - 100			5

Quality Control Data:

	<u># of Datums</u>	<u>Mean</u>	<u>Std. Dec.</u>	<u>2X S.D.</u>	<u>3X S.D.</u>	<u>% R.S.D.</u>	<u>True Value</u>	<u>Mean T.V.</u> %
<u>GFAAS:</u>								
EPA 4/100	6	.0162	.0004	.0008	.0012	2	.0160	101
EPA 4/500	6	.0028	.0010	.0020	.0029	36	.0032	88
<u>CP:</u>								
MC-1	19	.0054	.0005	.0010	.0016	9		
MC-2	19	.1110	.0084	.0167	.0251	8		

Blank Levels:

	<u># of Datums</u>	<u>Mean</u>	<u>Standard Deviation</u>
ICP:	47	.0009	.0008
FAAS:	20	<.002	<.002

Duplicate Data:

	<u>0-20%</u>	<u>20-50%</u>	<u>50-100%</u>	<u>Overall</u>
Number:	74	10	5	89
Standard dev.	.0005	.0007	.0015	.0007
Differences:				
Mean of	.0004	.0010	.0016	.0005
Differences:				
Sample Conc.	0 - .01	.01 - .025	.025 - .05	
Range ($\mu\text{gm/ml}$)				

APPENDIX 9

NETWORK TYPE : DAILY AIR
STATION # : NETWORK
PERIOD OF REPORT : 1 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 3747.
SAMPLES WITH FIELD COMMENTS : 366
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 162
AVERAGE AIR SAMPLING VOLUME(LITRES) : 26547.6
STANDARD DEVIATION : 3468.2
N IS : 3603.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	217	5.8
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	13	0.3
FLOW VOLUME SUSPECT(C)	9	0.2
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	48	1.3
FILTER PLACEMENT INCORRECT(E)	10	0.3
SAMPLE NOT SUBMITTED(F,K)	20	0.5
OTHERS(Q)	0	1.4

DATA RECOVERY

TOTAL # SAMPLES COLLECTED(NO MULTIPLE DAY RESULTS) : 3632.
RESULTS ANALYSED(NO MULTIPLE DAYS) : 21212.
TOTAL POSSIBLE # RESULTS : 26304.
PERCENT OF DATA RECOVERY : 80.64 %
PERCENT OF VALID DATA RECOVERY : 79.17 %
NO "U" & "P" & "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	35	0.93
SAMPLE LOST (X)	16	0.43
ABNORMAL SAMPLING PERIOD (Z)	114	3.04

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	119	0.54
NOT CORRECTED FOR PASSIVE (P)	152	0.70
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	2	0.01
EXCEED GROSS LIMIT (G)	84	0.38
EXCEED DIION RATIO LIMIT (D)	0	0.00

NETWORK TYPE : DAILY AIR
STATION # : 1011 Longwood
PERIOD OF REPORT : 1 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 1040.
SAMPLES WITH FIELD COMMENTS : 78
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 23
AVERAGE AIR SAMPLING VOLUME(LITRES) : 26180.0
STANDARD DEVIATION : 2463.7
M IS : 1023.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	14	1.3
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	3	0.3
FLOW VOLUME SUSPECT(C)	5	0.5
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	27	2.6
FILTER PLACEMENT INCORRECT(E)	4	0.4
SAMPLE NOT SUBMITTED(F,K)	8	0.8
OTHERS(Q)	0	2.8

DATA RECOVERY

TOTAL # SAMPLES COLLECTED(NO MULTIPLE DAY RESULTS) : 1029.
RESULTS ANALYSED(NO MULTIPLE DAYS) : 5968.
TOTAL POSSIBLE # RESULTS : 6594.
PERCENT OF DATA RECOVERY : 90.51 %
PERCENT OF VALID DATA RECOVERY : 88.85 %
NO "U" & "P" & "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	7	0.67
SAMPLE LOST (X)	8	0.77
ABNORMAL SAMPLING PERIOD (Z)	10	0.96

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	29	0.48
NOT CORRECTED FOR PASSIVE (P)	58	0.96
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	2	0.03
EXCEED GROSS LIMIT (G)	15	0.25
EXCEED DIOM RATIO LIMIT (D)	0	0.00

NETWORK TYPE : DAILY AIR
STATION # : 3011 Dorset
PERIOD OF REPORT : 1 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 988.
SAMPLES WITH FIELD COMMENTS : 185
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 53
AVERAGE AIR SAMPLING VOLUME (LITRES) : 27076.5
STANDARD DEVIATION : 2824.2
N IS : 938.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	123	12.4
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	3	0.3
FLOW VOLUME SUSPECT(C)	2	0.2
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	12	1.2
FILTER PLACEMENT INCORRECT(E)	2	0.2
SAMPLE NOT SUBMITTED(F,K)	0	0.0
OTHERS(Q)	0	1.6

DATA RECOVERY

TOTAL # SAMPLES COLLECTED(NO MULTIPLE DAY RESULTS) : 938.
RESULTS ANALYSED(NO MULTIPLE DAYS) : 5547.
TOTAL POSSIBLE # RESULTS : 6594.
PERCENT OF DATA RECOVERY : 84.12 %
PERCENT OF VALID DATA RECOVERY : 83.70 %
NO "U" & "P" & "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	3	0.30
SAMPLE LOST (X)	0	0.00
ABNORMAL SAMPLING PERIOD (Z)	50	5.06

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	7	0.12
NOT CORRECTED FOR PASSIVE (P)	3	0.05
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	18	0.31
EXCEED DIXON RATIO LIMIT (D)	0	0.00

NETWORK TYPE : DAILY AIR
STATION # : 4011 Charleston Lake
PERIOD OF REPORT : 1 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 961.
SAMPLES WITH FIELD COMMENTS : 50
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 47
AVERAGE AIR SAMPLING VOLUME(LITRES) : 27230.8
STANDARD DEVIATION : 4561.2
M IS : 917.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	38	4.0
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	3	0.3
FLOW VOLUME SUSPECT(C)	0	0.0
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	7	0.7
FILTER PLACEMENT INCORRECT(E)	0	0.0
SAMPLE NOT SUBMITTED(F,K)	10	1.0
OTHERS(Q)	0	0.6

DATA RECOVERY

TOTAL # SAMPLES COLLECTED(NO MULTIPLE DAY RESULTS) : 934.
RESULTS ANALYSED(NO MULTIPLE DAYS) : 5390.
TOTAL POSSIBLE # RESULTS : 6594.
PERCENT OF DATA RECOVERY : 81.74 %
PERCENT OF VALID DATA RECOVERY : 79.72 %
NO "U" & "P" & "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	14	1.46
SAMPLE LOST (I)	7	0.73
ABNORMAL SAMPLING PERIOD (Z)	27	2.81

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	47	0.85
NOT CORRECTED FOR PASSIVE (P)	31	0.56
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	10	0.18
EXCEED DIXON RATIO LIMIT (D)	0	0.00

NETWORK TYPE : DAILY AIR
STATION # : 6051 Fernberg
PERIOD OF REPORT : 1 JAN 1982 TO 1 JAN 1985

TOTAL # OF SAMPLES COLLECTED : 758.
SAMPLES WITH FIELD COMMENTS : 53
SAMPLES WITH OFFICE/VALIDATION COMMENTS : 39
AVERAGE AIR SAMPLING VOLUME(LITRES) : 25518.1
STANDARD DEVIATION : 3525.0
N IS : 725.0
NO "Z" AND FVOL .LE. 0

FIELD OBSERVATIONS(CODE)	FREQUENCY	% SAMPLES
SAMPLER MULFUNCTIONED(A)	42	5.5
HYDRO FAILURE(KNOWN/SUSPECTED)(B)	4	0.5
FLOW VOLUME SUSPECT(C)	2	0.3
CONTAMINATION(KNOWN/SUSPECTED)(D,H,I)	2	0.3
FILTER PLACEMENT INCORRECT(E)	4	0.5
SAMPLE NOT SUBMITTED(F,K)	2	0.3
OTHERS(Q)	0	0.0

DATA RECOVERY

TOTAL # SAMPLES COLLECTED(NO MULTIPLE DAY RESULTS) : 731.
RESULTS ANALYSED(NO MULTIPLE DAYS) : 4307.
TOTAL POSSIBLE # RESULTS : 6594.
PERCENT OF DATA RECOVERY : 65.32 %
PERCENT OF VALID DATA RECOVERY : 63.56 %
NO "U" & "P" & "F"

DATA VALIDATION OBSERVATIONS (OFFICE COMMENTS)	FREQUENCY	% SAMPLES
DATA UNVALIDATED (F)	11	1.45
SAMPLE LOST (X)	1	0.13
ABNORMAL SAMPLING PERIOD (Z)	27	3.56

RESULT REMARK CODE VALIDATION	FREQUENCY	% SAMPLES
UNRELIABLE RESULT (U)	36	0.81
NOT CORRECTED FOR PASSIVE (P)	60	1.34
NOT CORRECTED FOR PASSIVE; DET LIM (<P)	0	0.00
EXCEED GROSS LIMIT (G)	41	0.92
EXCEED DIXON RATIO LIMIT (D)	0	0.00

TD
195-54
06
83/1
/861